Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Reserve
A72
Ec72

BELGRADE
MAY 2 1938
Cotton
~~M. R. COOPER~~
~~E. P. KEELER~~
RETURN TO FOREIGN
FILES ROOM 4916

SPECIAL REPORT #336 - COTTO
COTTON GROWING IN THE U.S.S.
APRIL 11,1938
FF#30653
COPY 5

[illegible]

UNITED STATES
DEPARTMENT OF AGRICULTURE
LIBRARY

1862 1889

Reserve
BOOK NUMBER A72
Ec72

ACCOBIND FOLDER
Use Acco Fasteners for Binding

NO. AF 252

Made by ACCO PRODUCTS, INC.
Long Island City, N. Y. U.S.A.

BELGRADE
MAY 2 1938

SPECIAL REPORT No.336
COTTON
SOVIET UNION.

United States Department of Agriculture
Bureau of Agricultural Economics
Foreign Agricultural Service
Danube Basin District
Belgrade, Yugoslavia.

P K [illegible] file

30653

COPY 5

COTTON-GROWING IN THE SOVIET UNION.

RETURN TO FOREIGN
FILES ROOM 4918

Submitted by:

Aug 2, 1877 -

Louis G. Michael, ~~Agricultural~~ Attache.

April 11, 1938.

LIBRARY
RECEIVED
DEC 16 1955
U.S. DEPT. OF AGRICULTURE

SPECIAL REPORT No.336
COTTON
SOVIET UNION.

United States Department of Agriculture
Bureau of Agricultural Economics
Danube Basin District
Belgrade,Yugoslavia, April 11,1938.

Subject: Cotton-Growing in the Soviet Union.

Submitted by: Louis G.Michael Agricultural Attache.

For more than a decade before 1880 the United States of America supplied practically all of the cotton consumed by Russian textile mills. 1/ Then the Russians began to grow cotton from American seed and, during the next ten years, lint from Central Asia and Transcaucasia played an increasingly important role. Nevertheless, in 1890, the United States supplied 375,000 bales 2/to cover more than 60 per cent of the Russian mill consumption. 3/ During the next two decades, Russian mill consumption increased and, although in 1910 the cotton supplied by the United States was only 30 per cent of that consumption, the number of bales that we shipped to Russia reached 596,000. 4/ The average consumption of Russian textile mills just preceding the World War is reported to have been 1,750,000 bales; of which 900,000 bales or 52.2 per cent were grown in the irrigated regions of Central Asia and Transcaucasia; whereas 850,000 bales or 47.8 per cent were imported largely from the United States.

1/"La Production et le Commerce International du Cotton", International Institute of Agriculture, Rome, 1936, p.454. 2/ All bales referred to in this report are 478 pounds each. 3/Including Polish and Baltic industries formerly within Russian frontiers. 4/Volin, Lazar, "Russia", an article in the "World Cotton Situation" prepared in the Bureau of Agricultural Economics, Washington, D.C. April, 1935.

Table 1.- Cotton lint: Production, mill requirement with percentage of requirement produced a/ in the Soviet Union, pre-war compared with 1924-25 to 1929-30; 1931 to 1936 and plan for 1937

Year	Production	Mill requirement	Percentage of mill requirement	
			Domestic production	Foreign production
	Million bales	Million bales	Per cent	Per cent
1909-10 to: 1913-14	0.90	1.75	52.2	47.8
1924-25	0.45	0.98	42.3	57.7
1925-26	0.78	1.23	61.5	38.5
1926-27	0.83	1.42	54.9	45.1
1927-28	1.10	1.63	59.0	41.0
1928-29	1.13	1.75	66.6	33.4
1929-30	1.28	1.50	80.7	19.3
1930	1.59	b/	b/	b/
1931	1.84	1.61	86.4	13.6
1932	1.79	1.88	94.8	5.2
1933	1.89	1.87	97.4	2.6
1934	1.72	c/ 2.05	-	-
1935	d/ 2.50	d/e/ 2.02	-	-
1936	d/ 3.56	d/e/ 2.75	-	-
1937		e/f/ 3.37		

a/Percentage of domestic or foreign lint used in any given year does not pertain to the production or importation during that year. b/ Not reported on calendar year basis. c/ Compiled from rounded figure in "Socialist Construction in U.S.S.R.", Moscow 1936, p.227. d/ Preliminary official figure. e/ "Narodno-Khozyaistvenye Plan Souza S.S.R. na 1937 god", Moscow 1937, pp.98-99. f/Plan.

Production 1909-10 to 1913-14 and 1924-25 to 1927-28 compiled from official sources in the Foreign Agricultural Service. Converted on the basis of 31 pounds of lint to 100 pounds of seed cotton (See footnote 4.) Other data, except as noted, compiled from "Ekonomika Khlopkootchistitelnoi Promyshlenosti", Moscow, 1937, pp.12 and 16.

Then came the World War and revolution in Russia followed by civil strife. During this period, Russian cotton-growing as a commercial industry, ceased to exist. Production of cotton,by 1922, had fallen off to only 31,000 bales grown on 174,000 acres scattered in tiny patches throughout Central Asia and Transcaucasia.

Beginning with this insignificant acreage, cotton-growing in Russia has been reconstructed under the control of the Soviet Textile Industry itself; which, from the outset, strove to supply its own needs, as far as possible, with domestically grown cotton. During the next few years, the Textile Industry increased its mill consumption to 1,750,000 bales (1928-29); equal to the pre-war average consumption of the spinners of the former Russian Empire. (Table 1.) However, in 1928-29, domestically grown cotton represented fully 66.6 per cent of the mill consumption as compared with 52.2 per cent before the World War.

At the beginning of the first five-year plan period, on July 18,1929, the Central Committee of the All-Russian Communist Party issued the following decree designed to further speed up domestic production and decrease imports:

> " The development of cotton production in the current five year period (1928 to 1932) must follow the lines of a maximum utilization of all resources for the increase of cotton acreage and the increase of cotton yields in order to be able at the end of five years (1932) to free the textile industry of the Union from the necessity of importing foreign cotton, and also to have the necessary (reserve) stocks for further development of the textile industry." 1/

The intent of this decree was nearly realized by 1933, in which year only 2.6 per cent of the 1,870,000 bales worked up in Soviet mills was reported to be imported cotton and 97.4 per cent was grown in the irrigated regions of Central Asia and Transcaucasia and in the European Part of the Soviet Union in the vicinity of the Black and Caspian Seas.

There is no official estimate, after 1933, of the percentage of foreign cotton consumed each year by Soviet textile mills; but, by 1936, consumption rose to 2,750,000 bales; whereas, the production of 1935 was 2,500,000 bales. During 1936, the Soviet Union imported only 77,000 bales of which scarcely 20,000 bales originated in the United States. (Table 2.)

Table 2.- Cotton: Imports into the Soviet Union by countries of origin 1933-36 and 7 months 1937

Country from which imported	Year beginning January 1				
	1933	1934	1935	1936	1/ 1937
	Bales 2/	Bales 2/	Bales 2/	Bales 2/	Bales 2/
United States	87,626	46,490	130,634	19,578	12,923
Egypt	-	-	23	-	-
Persia	15,921	62,434	66,000	43,663	50,987
Turkey	466	-	2,292	4,391	-
Other	-	5,792	4,995	9,229	8,219
Total	104,013	114,716	203,944	76,861	72,129

1/ First seven months. 2/ Bales of 478 pounds.
1933 from records of Division of Statistical and Historical Research compiled from original sources. Quoted by L.Volin (See footnote 4/ page 1.)
1934-36 from "Statistika Vneshnei Torgovli U.S.S.R."

1/Djanumyan, S...., Ekonomika Khlopkootchistitelnoi Promyshlenosti", Moscow,1937.

During the first seven months of 1937, the Soviet Union imported 72,000 bales of cotton of which only 13,000 bales were of American origin. The plan of Soviet national economy for 1937 called on the textile mills to work up 3,360,000 bales of cotton lint largely of the 1936 production, which has been estimated at 3,410,000 bales or 50,000 bales in excess of the planned mill requirement. Whether this plan was fulfilled or not, the percentage of the total 1937 consumption of the Soviet mills that originated in United States must have been negligeable.

The proportion of cotton,used in Russian mills, that was grown in the United States has dwindles from about one third,in 1910,to insignificance in 1937. Not only is there no possibility of regaining any important part of our former trade in cotton with the Soviet Union, but the question arises: will the Soviet Union develop into a competitor of United States cotton on the markets of the world? This depends upon the quantity and quality of the cotton that Russia can produce.

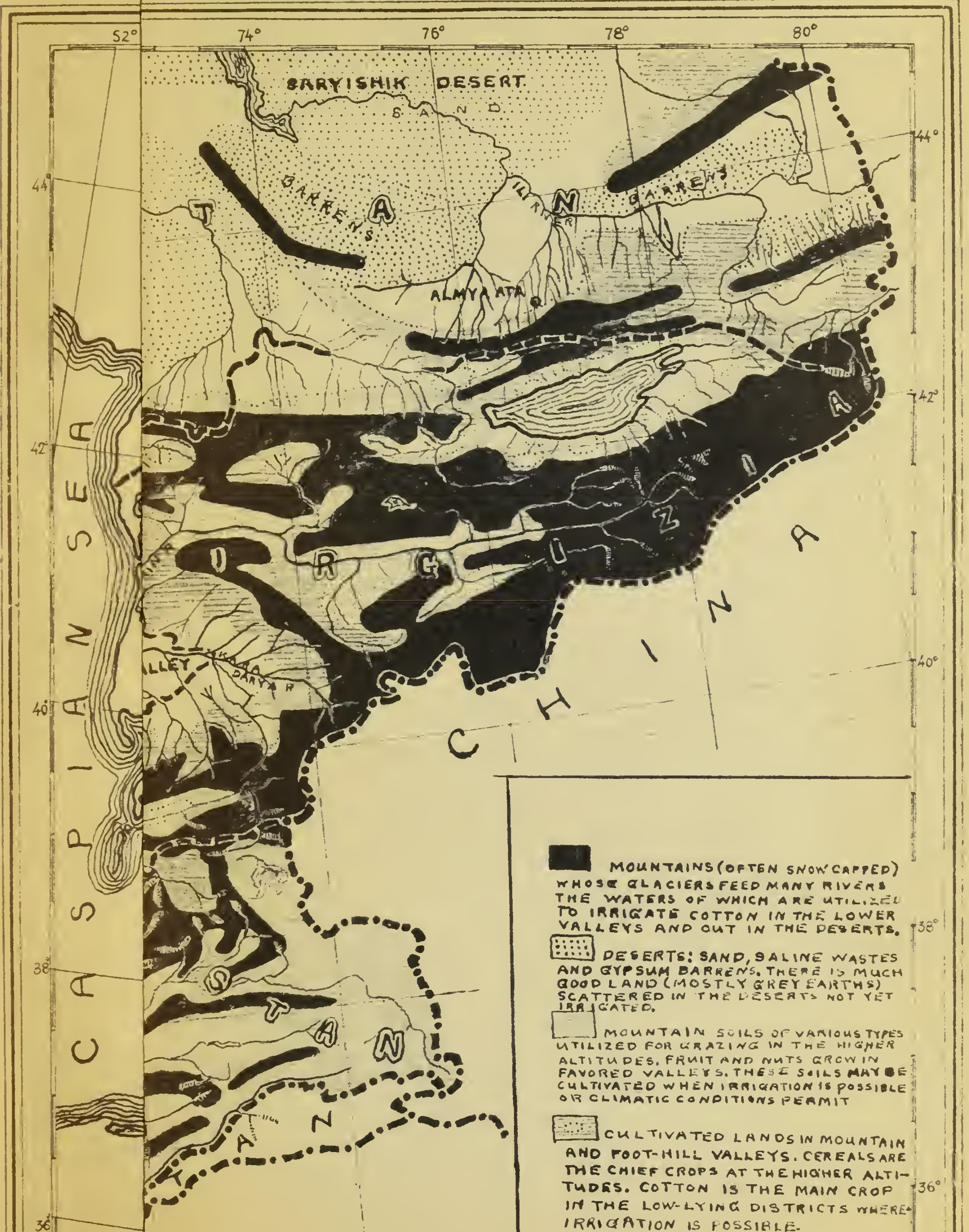
The possibility of the rapid expansion of cotton production in the Soviet Union lay in the potentialities of its soil and climate; in the producing abilities of the peoples living in those regions best suited to growing cotton and in the driving force of a Government determined to make the country independent of outside sources of supply. To judge the significance of the changes that have taken place in their relation to possible future developments, we must know something of the country itself, of the history of the people as far as it pertains to the growing of cotton, and of the policies of the Government as revealed in its activities in developing the cotton industry.

In its beginning, the cotton industry of Russia centered in Central Asia.1/

1/The term Central Asia is used loosely to include Central Asia proper (Uzbekistan, Turkmenistan, and Tadjikstan), the southern cotton producing districts of the autonomous republics of Kazakstan and Kara Kalpak and certain favored valleys of western Kirgizia. It is roughly equivalent to former Russian Turkestan, Trans-Caspian Krai, The Emirate of Bukhara and the Khanate of Khiva.

SPECIAL
COTTON
SOVIET

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
FOREIGN AGRICULTURAL SERVICE
DANUBE BASIN DISTRICT



■ MOUNTAINS (OFTEN SNOW CAPPED) WHOSE GLACIERS FEED MANY RIVERS THE WATERS OF WHICH ARE UTILIZED TO IRRIGATE COTTON IN THE LOWER VALLEYS AND OUT IN THE DESERTS.

▨ DESERTS: SAND, SALINE WASTES AND GYPSUM BARRENS. THERE IS MUCH GOOD LAND (MOSTLY GREY EARTHS) SCATTERED IN THE DESERTS NOT YET IRRIGATED.

☐ MOUNTAIN SOILS OF VARIOUS TYPES UTILIZED FOR GRAZING IN THE HIGHER ALTITUDES. FRUIT AND NUTS GROW IN FAVORED VALLEYS. THESE SOILS MAY BE CULTIVATED WHEN IRRIGATION IS POSSIBLE OR CLIMATIC CONDITIONS PERMIT

▤ CULTIVATED LANDS IN MOUNTAIN AND FOOT-HILL VALLEYS. CEREALS ARE THE CHIEF CROPS AT THE HIGHER ALTITUDES. COTTON IS THE MAIN CROP IN THE LOW-LYING DISTRICTS WHERE IRRIGATION IS POSSIBLE.

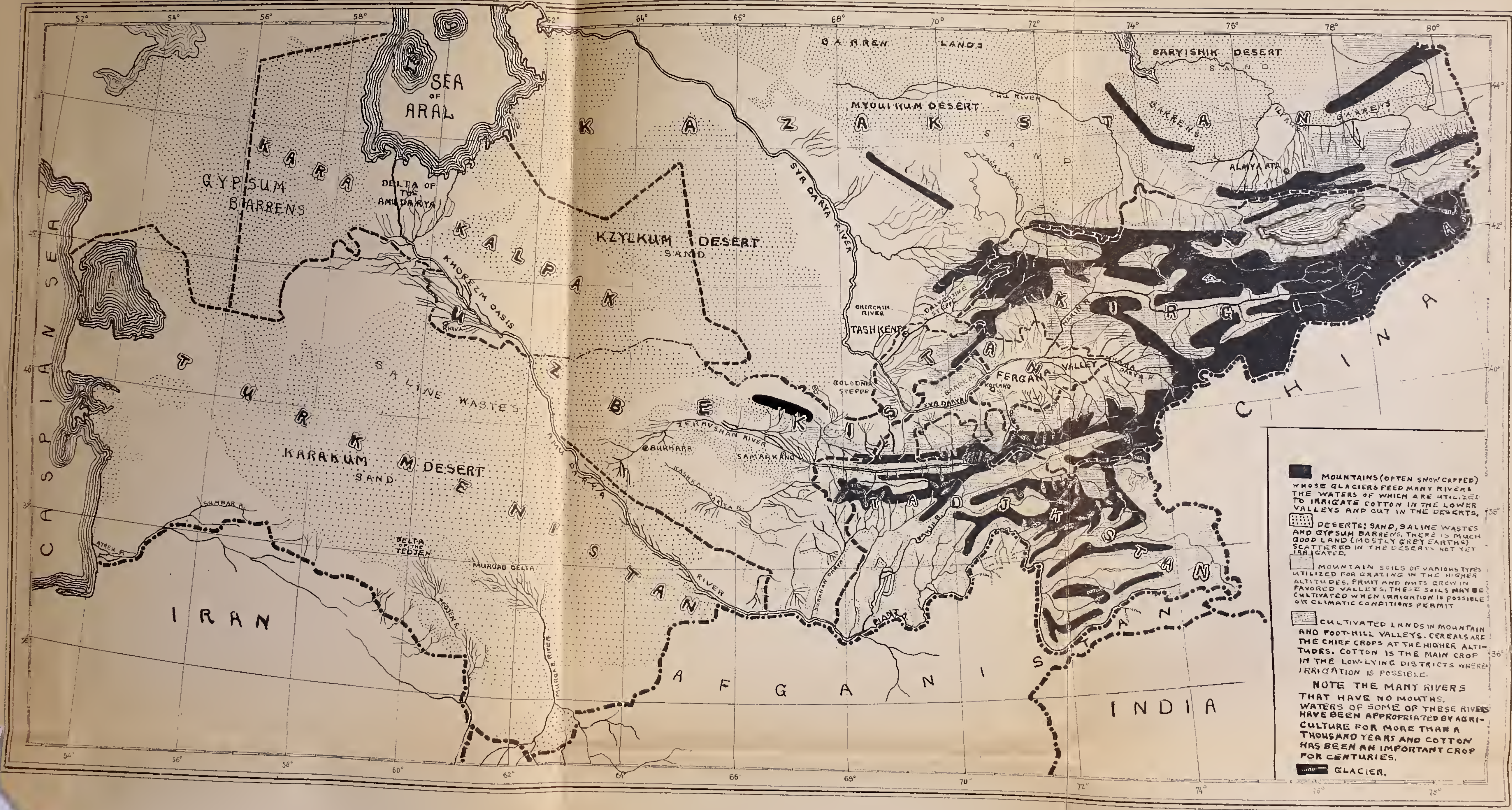
NOTE THE MANY RIVERS THAT HAVE NO MOUTHS. WATERS OF SOME OF THESE RIVERS HAVE BEEN APPROPRIATED BY AGRICULTURE FOR MORE THAN A THOUSAND YEARS AND COTTON HAS BEEN AN IMPORTANT CROP FOR CENTURIES.

▬ GLACIER.

SPECIAL REPORT 336
COTTON
SOVIET UNION

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
FOREIGN AGRICULTURAL SERVICE
DANUBE BASIN DISTRICT

CENTRAL ASIA: A LAND OF RIVERS WITHOUT MOUTHS, LAKES WITHOUT OUTLETS AND SEAS WHOSE WATERS NEVER REACH THE OCEAN.



■ MOUNTAINS (OFTEN SNOW CAPPED) WHOSE GLACIERS FEED MANY RIVERS THE WATERS OF WHICH ARE UTILIZED TO IRRIGATE COTTON IN THE LOWER VALLEYS AND OUT IN THE DESERTS.

▦ DESERTS: SAND, SALINE WASTES AND GYPSUM BARRENS. THERE IS MUCH GOOD LAND (MOSTLY GREY EARTHS) SCATTERED IN THE DESERTS NOT YET IRRIGATED.

☐ MOUNTAIN SOILS OF VARIOUS TYPES UTILIZED FOR GRAZING IN THE HIGHER ALTITUDES. FRUIT AND NUTS GROW IN FAVORED VALLEYS. THESE SOILS MAY BE CULTIVATED WHEN IRRIGATION IS POSSIBLE OR CLIMATIC CONDITIONS PERMIT

▤ CULTIVATED LANDS IN MOUNTAIN AND FOOT-HILL VALLEYS. CEREALS ARE THE CHIEF CROPS AT THE HIGHER ALTITUDES. COTTON IS THE MAIN CROP IN THE LOW-LYING DISTRICTS WHERE IRRIGATION IS POSSIBLE.

NOTE THE MANY RIVERS THAT HAVE NO MOUTHS. WATERS OF SOME OF THESE RIVERS HAVE BEEN APPROPRIATED BY AGRICULTURE FOR MORE THAN A THOUSAND YEARS AND COTTON HAS BEEN AN IMPORTANT CROP FOR CENTURIES.

▬ GLACIER.

CENTRAL ASIA.

The cotton producing districts of Central Asia lie south of the 45-th north parallel and north of 35° 17' north latitude in that part of the Soviet Union bounded on the west by the Caspian Sea and on the east by China. 1/ To the south, are the mountain regions of Iran and Afganistan, and farther to the east rise the ranges of the Hymalayas. The south-eastern part of Central Asia, comprising the republics of Kirgizia and Tadjikstan, is ribbed with chain upon chain of lofty snow capped mountains culminating in two of the highest peaks in the world, (Mount Stalin and Mount Lenin) which reach altitudes well above 20,000 feet. From the foothills of the mountain-regions, the floor of a dried up sea extends for more than 1,200 miles toward the west and north. This plain, sloping to the Caspian and Aral seas, is characterized by stretches of barren sands, salin steppes and gypsum wastes. It is, for the most part a bleak wind swept rolling plain in winter and, in summer, a broiling desert. Here lie the Republics of Turkmenistan, Kara Kalpak, and the southern districts of Kazakstan. On the fringe of the desert and pushing back into the foothills and valleys of the mountains to the east, is the Republic of Uzbekistan, the most important cotton-growing region in the Soviet Union.

The plains region is arid 2/ with practically no rain in summer. The vast southeastern mountain region, however, forms several catch-basins for summer rains and winter snows. Here the snow accumulates until its weight forces it to flow down the winding canyons in the form of glaciers. In summer, these glaciers reach altitudes low enough to encounter the dominating influence of the sun 3/and, melting, feed three mighty river systems: 4/ the Amu Darya, the Syr Darya and,

---

1/Chinese Turkestan or Sin-Kiang. 2/Annual precipitation less than 10 inches.
3/Adapted from Davis, Arthur Powell, "Irrigation in Turkestan", Civil Engineering vol.2, No.1, January 1932.

4/

River systems		Mean annual Discharge: Acre-feet.	Valley areas Total acres.
1.- Amu Darya		53,200,000	9,754,000
2.- Syr Darya	a/	22,120,000	6,730,000
3.- Zeravshan		4,160,000	1,875,000
Total		79,480,000	18,359,000

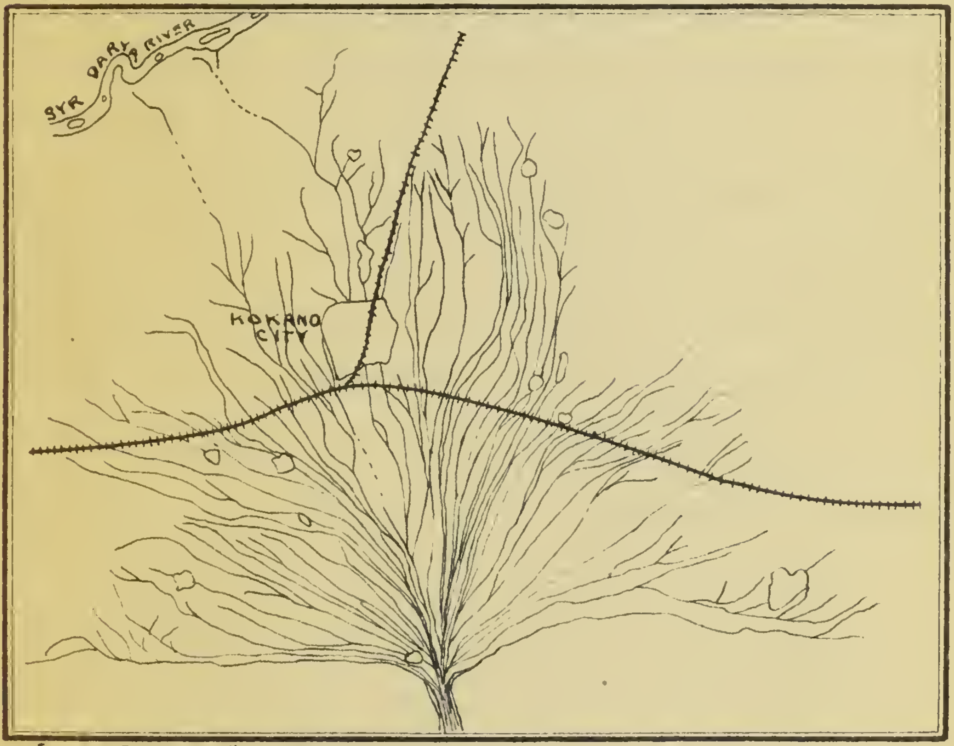
a/Includes Chirchik river.
Davis, Arthur Powell, Ibid.

between these two, the Zeravshan. The Amu Darya and the Syr Darya, both flowing west and north, reach the Sea of Aral after giving up part of their waters to irrigated districts along the way. The Zeravshan, after watering the Oasis of Samarkand, flows westward through a series of canals to beyond Bukhara, where, wholly consumed, it fades into the desert sands. It has no mouth. There are other lesser streams: the Vakhsh and the Pianj which unite to form the Amu Darya; the Narin, the Kara Darya and the Chirchik which are tributaries to the Syr Darya. Part of the waters of these rivers is used to irrigate cotton. Many other rivers, tumbling down through the foothills, fray out like loose rope ends into irrigation canals (See Figure 1) and are completely drunk up by thirsty plants or seep into the still more thirsty sands. 1/ Central Asia is a region of rivers without mouths, of lakes that have no outlets, of seas whose inflow is offset by evaporation and whose ever-heavier salt waters never reach the ocean. 2/

For centuries nomad tribes have sought scant pasturage on the lowland desert wastes while other nomad bands have grazed their flocks and herds upon the alpine steppes; and, in between, on the fringe of the desert and in hill-locked valleys, (wherever water could be brought to form oases) or upon hill sides (wherever there was sufficient rain), millions of farmers 3/ have tilled the soil for untold generations. Civilization after civilization has been built up and destroyed in this mountain-desert region by Turk, Mongol and Tarter. The oases have probably been irrigated for thousands of years and cotton has been a staple crop for centuries. An early reference to cotton growing in this region was made more than 700 years ago at the time of the coming of the Mongol hords under Genghis Khan.

1/ Other sources of water supply are the subterranean streams which occasionally flow beneath the floor of the desert and whose waters, bursting out in water-holes, are used for irrigating the oases that have grown up around them. (Gwynn, W.M., State Department despatch No.436, August 25,1934, p.4. 2/ Mikhaylov,N.,"Soviet Geography", Methven, London, 1935. 3/ More than 10,000,000 people lived in Central Asia, Southern Kazakstan and Kirgizia in 1933.

THE DELTA OF THE RIVER SOKH IN THE FERGANA VALLEY, UZBEKISTAN.



Source: "ROSSIYA", Vol. XIX., St Petersbourg, 1913.

Figure 1.- The RIVER SOKH frays out, like the loose end of a rope into scores of canals that irrigated 207.000 acres in 1935, of which 155.000 acres were under cotton.

About the time that the English barons were demanding that King John grant them a charter, Mohammed-ben-Takash, the reigning Sultan of Islam, encouraged Genghis Khan to send a caravan from his capital north of the great wall of China to trade with the Uzbek cities of Khiva, Samarkand, and Bukhara. The merchants of the caravan were murdered and the goods stolen. Then Genghis led his armies westward out of Mongolia, slaughtered thousands of the leading Uzbeks and built high pyramids of skulls as a warning to violators of trade compacts. Doubting if he might not have been over impulsive, he sent to China for a certain wise man named Chang Chun, to judge him as to the rectitude of his acts. Chang Chun, accompanied by a disciple, reached Samarkand about 1222. 1/ The disciple kept a record of the journey and in that record wrote:

" It is here they make the stuff called "tu-lu-ma", which gave rise to a popular story about a material made from sheep's wool planted in the ground. 2/ It is like Chinese willow-down, very fine, soft and clean. Out of it they make thread, ropes, cloth, and wadding. The farmers irrigate their fields with canals; but the only method employed by the people of these parts is to dip a pitcher and carry it on the head. Our Chinese buckets delighted them. 'You Chinese are so clever at everything' they said." 3/

Before the coming of Genghis Khan, the Uzbeks or their predecessors had grown varieties of a cotton called "Guzah" 4/ for generations. It was a coarse fibred, short stapled cotton developing in hard burrs that often had to be cracked open to get at the locks. But it was hardy and could resist drought otherwise it could never have survived the hard usage of the primitive methods of agriculture employed and the insufficient irrigation; without which there was no certainty of a crop.

1/ 270 years before America was discovered. 2/During the middle ages, a legend circulated in Europe that In Tartary there grew a plant that produced tiny lambs of flesh and blood whose wool was wonderously white and fine. An English traveler claims to have eaten these "vegetable lambs" and to have found their flesh delicious. (F.Wilkinson, "History of the Cotton Plant", D.Appleton & Co., New York and London, 1919, pp.9-19. 3/ Fox, Ralph, "Genghis Khan", The Albatross,Paris, 1936,p.149. 4/Guzah" cotton (Gossupium herbaceum L.) is probably of Indian origin and entered Central Asia through Persia. ("Rossiya", St.Petersbourg,1913.)

The descendents of the Uzbeks, mingled with Turk and Mongol and Tarter, continued to grow "Guzah" cotton for more than 600 years. Their trading caravans of plodding camels first brought yarn of spun "Guzah" and later unspun cotton accross the deserts over the ancient trade route to Orenburg, at the south of the Ural mountains, for use in the household loomes of Russia. Central Asian cotton was, beyond doubt, used in the factory type of spinning that developed in the vicinity of Moscow. 1/ But, after the ban on exports of textile machinery from England was lifted in the 1840's and the Russian spinning and weaving industry assumed important proportions, Russian spindles were fed for the most part by cotton from the United States. 2/

Early in the 19-th century, trouble arose between the Central Asiatic States and Imperial Russia. It may have been that the Uzbek caravans ran foul of wandering bands of Russian Cosacks 3/grazing their gaunt herds from water-hole to water-hole in the deserts. Whatever the initial cause, punative expeditions sent out by the Tzar's military command developed into a war of conquest that continued sporadically for 45 years (1839-94.)

About the middle of the 19-th century, the advantage to Russian spinners of developing a home supply of cotton was emphasized by the war between the North and the South in the United States that shut off exports from the ports of our southern states and created a cotton famine in Europe. "The Russian commercial spheres directed, therefore, their attention to Central Asia, they increased the importation of cotton from Central Asia and pursued with greater energy the agression against the Central Asian states. 4/

1/Before the revolution the Russian cotton textile industry was concentrated in the Moscow and Ivanov-Voznessensk districts. "La Production et le Commerce International du Cotton", International Institute of Agriculture, Rome, 1936.
2/Volin, Lazar (Footnote 4/page 1.) 3/ Not to be confused with Kazaks who are a Mongolian people not Slavic. 4/Ilias Alkin, quoted by Gwynn, W.M. "Memorandum on Cotton Growing in Russia", State Department Despatch No.436, Riga, August 25,1934.

To consolidate their hard-won cotton-producing territories and to speed up the transport of cotton to the textile centers in European Russia, a railroad was built from the Caspian Sea to Charjui on the Amu Darya (1881-1886.) 1/About this time under the stimulation of the spinners and the Russian Government, American upland cotton began to supplant 2/ the coarse-fibred, short-stapled "Guzak". By the beginning of the World War, this primitive cotton had practically disappeared as a commercial crop in Central Asia. The former Russian Government encouraged the pre-war expansion of growing cotton of American origin in Central Asia through the construction of new canals 3/ to facilitate irrigation and attempted to improve the old irrigation systems. 4/ Technical assistance was rendered to growers by breeding and experimental stations, as well as by cotton-growing specialists operating similar to, but not as effectively, as county agents in the United States.

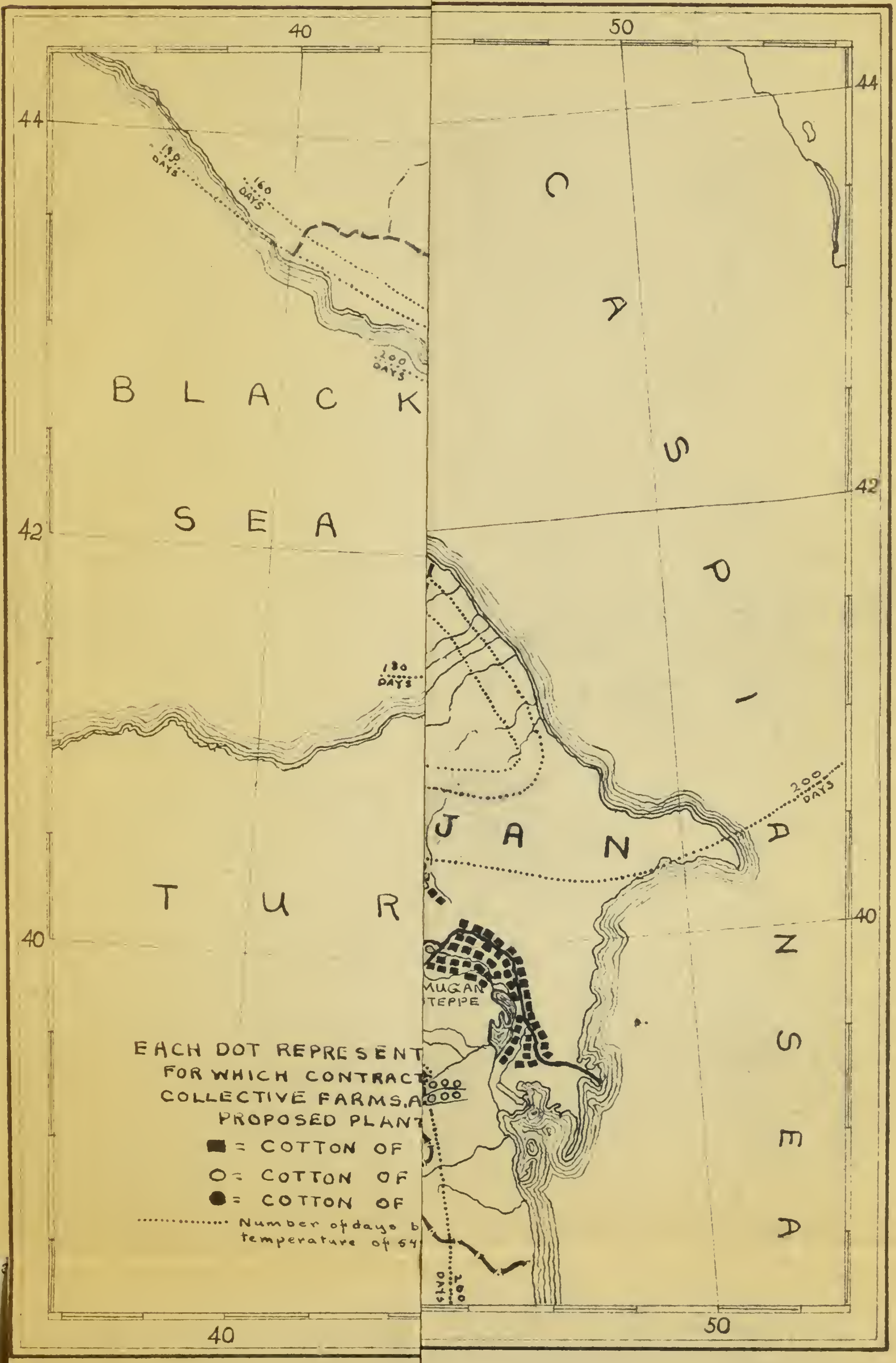
By 1913, the cotton area of the former Russian Empire had reached 1,700,000 acres, which under the stimulation of war activities increased to more than 2,000,000 acres in 1915. Of this acreage, Central Asia accounted for 88 per cent; whereas, 12 per cent was planted in Transcaucasia. 5/

1/This line was extended to Samarkand in 1886-1888. During the next eleven years, further construction opened up the Fergana valley (Russia's most important cotton center) and a branch line was extended northeast to Tashkent; which today is the administrative center of the Uzbek republic. From Gwynn, W.M. Ibid. 2/ After trying out Sea Islan cotton (1872) without practical success, Russian cotton breeders concentrated upon American upland and developed several strains more or less adapted to Russian conditions. Of these strains only two have survived to the present day:- "Novrotzki"developed in 1913 and No.169 "Dekhkan" developed in 1914. Only relatively small acreages of these two varieties were planted in 1937. 3/Most of this development was for the direct improvement of the Imperial estates and crown lands but, nevertheless, the peasantry, particularly Russian settlers brought in by Government policy, did derive a certain benefit. (See "Rossiya", St.Petersbourg, 1913. Vol.XIX.) 4/The construction of these canals was most primitive. There were no sluces to control the flow of water into the canals. There was usually a dam, made of such materials as were near at hand, where the canal left the river to insure the entrance of a sufficient quantity of water. These primitive dams required repair each year but were cheap. Water was carried over depressions by aquaducts of wood and these required repair almost every year. The cleaning of canals from mud was done by those who used them. It was estimated, before the World War, that 700,000 days work per year were expended on conditioning the canals in the Khiva district, Khorezm Oasis. The former Russian Government tried to bring order out of this chaos but gave it up as a bad job and left the control of water in local hands. "Rossiya",Vol.XIX, St.Petersbourg, 1913. p.424. 5/Volin, Lazar, footnote 4,page 1.

SPECIAL REPORT No 336
COTTON
SOVIET UNION

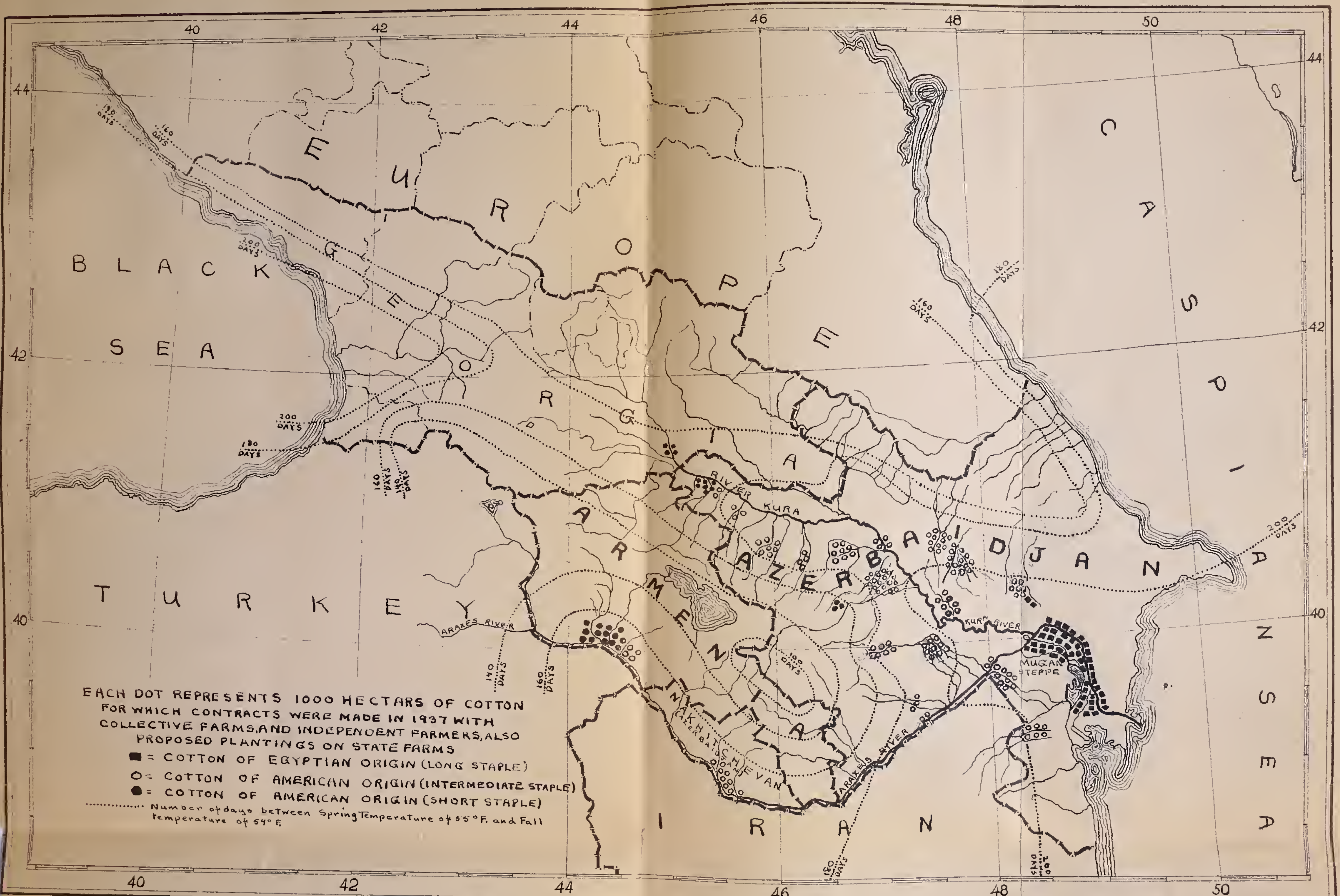
TED STATES DEPARTMENT OF AGRICULTURE
REAU OF AGRICULTURAL ECONOMICS
REIGN AGRICULTURAL SERVICE
NUBE BASIN DISTRICT

TRANS



UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
FOREIGN AGRICULTURAL SERVICE
DANUBE BASIN DISTRICT

TRANSCAUCASIA: COTTON PRODUCING RAIONS (COUNTIES) 1937.


EUROPE
BLACK SEA
GEORGIA
ARMENIA
AZERBAIDJAN
CASPIAN SEA
TURKEY
IRAN
NAKHITCHEVAN
NAKH. AZERB.
RIVER KURA
KURA RIVER
ARAXES RIVER
MUGAN STEPPE
140 DAYS
160 DAYS
180 DAYS
200 DAYS
40
42
44
46
48
50
EACH DOT REPRESENTS 1000 HECTARS OF COTTON FOR WHICH CONTRACTS WERE MADE IN 1937 WITH COLLECTIVE FARMS, AND INDEPENDENT FARMERS, ALSO PROPOSED PLANTINGS ON STATE FARMS
■ = COTTON OF EGYPTIAN ORIGIN (LONG STAPLE)
○ = COTTON OF AMERICAN ORIGIN (INTERMEDIATE STAPLE)
● = COTTON OF AMERICAN ORIGIN (SHORT STAPLE)
.... Number of days between Spring Temperature of 55°F. and Fall temperature of 64°F.

TRANSCAUCASIA

Westward from Central Asia, accross the Caspian Sea and south of the lofty, snow-capped range of the Caucasas mountains, that mark the dividing line between Europe and Asia, lies Transcaucasia. This land is divided by the Syrian mountains into two parts of entirely different character. To the west, the land falls away to the shores of the warm Black Sea and lies open to warm winds from that direction, while it is sheltered from the cold winds of the north by the main range of the Caucasas. This is Georgia, that the natives call "Gruzi" - a country of sunshine and warmth. 1/

The eastern part of Transcaucasia slopes towards the Caspian Sea and lies open to the parched east winds from the Central Asiatic deserts. The climate is arid and there are vast stretches of steppe, semi-desert and desert-land uninhabited and waterless. This is Azerbaidjan, the most important cotton-growing district of Transcaucasia, through which, from the Gruzi highlands, flows the River Kura.

Just before the Kura falls into the Caspian Sea it is joined by the Araxes, which takes its rise in Turkey and, flowing around the range of the lesser Caucasas, forms part of the boundary line between Transcaucasia, Turkey and Persia. The lesser Caucasas is a vast volcanic region, composed of three great table lands lying high above the sea and shut in by the encircling mountains. Armenia, the third republic in Transcaucasia, occupies the central and largest of these table lands, which has an elevation of 2,600 to 5,000 feet. 2/

The Azerbaidjan Turks may possibly have brought "Guzah" cotton into the county from the east. Primitive varieties of cotton were grown in Transcaucasia at the middle of the last century 3/but, during the latter part of the 19-th century, these gave place to American varieties introduced by the Russian Government.

1/The Intourist Pocket Guide to the Soviet Union", Moscow, 1938. The farm lands on the western slopes of Georgia are largely devoted to the production of commodities more valuable than cotton: Citrus and other fruit, tea etc.
2/ Cotton can be grown only in the low lying valleys. 3/"Cotton-growing in Transcaucasia", Tiflis, 1912, quoted by Volin (Footnote 4 page 1.)

There is, to-day, only a small area under cotton in Armenia 1/ in the high middle valley of the Araxes river. There is a still smaller acreage in Georgia 1/ principally in the high lying valley near the frontier of Azerbaidjan. But, in the lower valley of the Kura, where it widens out into the bottom lands of a dried-up arm of the Caspian Sea, below the level of the ocean, to form the Mugan steppe, long staple Egyptian cotton 1/is grown under irrigation. The upper waters of the Kura, the Araxes and several lesser streams flowing down from the mountains through foot-hill valleys are used to irrigate cotton of American origin 1/- long staple in the lowlands, quick-maturing, short staple in the higher elevations.

Although there is considerable rainfall in the Black Sea litoral of Georgia, most of Transcaucasia lies in the "rain-shadow" of the Caucasas mountains where there is no rain of agricultural significance in summer and, except in the lesser Caucasas mountains, little rain at any time. Practically all farming is dependent on irrigation with glacial water from the snow-capped peaks of the high Caucasas or from rain and snow falling in the mountains. In 1932, the total area of land under cultivation in Transcaucasia was only 3,264,000 acres of which 3,000,000 acres were under irrigation:- 408,000 acres in Armenia; 556,000 acres in Georgia and 2,037,000 acres 2/ in Azerbaidjan. 3/

BREAD, WATER AND THE COTTON ACREAGE

The pre-war expansion of cotton acreages in Russia, was largely at the expense of wheat and barley acreages in the irrigated oases and, even before the World War, Central Asia and Transcaucasia, were both regions of bread-cereal deficit. That is to say, the best of the irrigation lands were devoted to cotton;

1/Areas under contract in 1937 were reported at 44,000 acres in Armenia, 10,000 acres in Georgia and, in Azerbaidjan, 124,000 acres Egyptian and 346,500 acres American. "Kontraktatziya i Zagotovka Khlopka", Moscow 1937. 2/ "World Cotton Production and Trade", International Institute of Agriculture, Rome, 1937.
3/The total cultivated area makes up only one-tenth of Azerbaidjan. Nine-tenths of the republic is wilderness furnishing scant pasturage in winter and which in summer becomes a parched desert.

whereas other crops were to a large extent, crowded off onto the marginal, unirrigated lands, the so-called, "bogara" lands. 1/ Such lands were planted with quick maturing varieties of wheat, barley, millet, etc. that complete their crucial growth before the coming of summer heat. Yields on these marginal lands were always low and crop-failures were frequent. Although yields of grain on irrigated lands were more dependable, acreage was relatively small and production in Central Asia and Transcaucasia was not sufficient to cover the pre-war demand for bread. In inverse proportion to the uncertain production of the "bogara" crops, greater or less quantities of wheat and flour as well as feed grains had to be shipped south into Central Asia and Transcaucasia each year from the grain-surplus regions in return for cotton shipped to the north. 2/ Consequently, when the World War diminished shipments of cereals to the south and when, later, revolution and civil strife completely shut off both the demand for cotton in European Russia and the compensating grain supply from the north, starvation threatened the populations of Central Asia and Transcaucasia who shifted their available acreage from cotton to food-stuffs, to feed grains and to forage.

1/On the margins of irrigated oases, are areas that are not irrigated every year on account of shortage of water in the rivers whenever there has been less than the customary fall of snow in the mountains the previous winter. Some land in each irrigated district is too elevated to be served by the canals. Often land lies at a distance from the villages in the foothills and at the sides of valleys at elevations out of reach of irrigating canals. All such areas are classed as "Bogara" lands. "Bogara" seeding depends for success upon moisture of fall-rains and winter-snows conserved in the soil as well as upon spring rainfall. There is, as a rule, no summer rainfall of agricultural significance in most parts of Central Asia. "Rossiya", "Turkestan Krai", Vol. XIX, St.Petersbourg 1913, pp.427-431. A similar situation exists in Transcaucasia. L.G.M. 2/The grain was brought into Central Asia chiefly over a single track railroad completed in 1905, that roughly followed the ancient trade route from Orenburg at the south of the Ural mountains to Tashkent the present capital of Uzbekistan. In 1913 construction was begun on a second railway to connect Central Asia with the grain producing regions of Western Siberia. After an interruption caused by the World War and the revolution, the building of the line from Tashkent to Semipalatinsk, now known as the "Turksib" line, was completed in 1931. Gwynn, W.M., State Department Despatch No.436, p.9. This line connects with a spur leaving the Transiberian Railway at Novosibirsk and passing south through the important grain center about Barnaul.

The Central Asiatic peasants, particularly, had passed through such a severe experience of near-famine during the revolution and civil war; that, when the Soviet Textile Industry in 1921-22, undertook to re-construct cotton-growing on an extensive scale, farmers were hesitant to give up growing their home supply of food 1/ and to again put themselves into the dangerous position of placing the greater part of the irrigated lands under cotton.

In order to reshift acreage in Central Asia and Transcaucasia back to cotton, the cotton-procurement agencies of the Textile Industry radiating out from the ginneries as centers, had to offer special inducements to each individual farmer to persuade him to sign a contract to grow a specified quantity of cotton on a certain acreage. The chief inducement was that those signing contracts were entitled to purchase, through the procurement agents of the textile industry, at low prices: 2/ food, feed 3/ and fodder; as well as certain consumer goods that were otherwise practically unobtainable; such as: manufactured goods, implements and machinery, fertilizers, seeds, iron, petroleum, matches, salt, axle-grease etc. The success of the contract system supported by the distribution of consumer goods, in shifting acreage from other field crop production to cotton, is evidenced by the fact that during the next seven years (1922 to 1928 inclusive) the cotton acreage of Central Asia and Transcaucasia was built up from 174,000 acres to 2,394,000 acres 4/ or nearly 400,000 acres more than the pre-revolutionary peak. (Table 3.)

1/The close balance between cotton and grain acreages, requiring a supplemental supply of food from outside sources, has been a problem of long standing in Central Asia. Describing conditions in Turkestan 700 years ago, Ralph Fox writes: "The growth of commerce with the Nomads meant that more land had to be given up to cotton to provide them (the Mongols) with ropes, clothes and materials they needed, and so ever increased the danger of famine when the burden of war and taxation made it impossible to buy food." "Genghis Khan", p.149. 2/ These early contracts assured fixed quantities at low prices of specified commodities to each producer of a certain quantity of cotton per acre, but emphasis was placed on acreage. Djanumyan, S.A. "Ekonomika Khlopkootchistitelnoi Promyshlenosti" Gizlegprom,Moscow, 1937, pp. 8-16. 3/As cotton supplanted cereals, increasing quantities of grain were shipped in from surplus regions of the north as indicated by the following imports into Central Asia: 1924-25 ÷ 24,250 short tons; 1925-26: 280,000 tons; 1926-27: 482,000 short tons; 1927-28: 605,140 short tons. The utilization of land in Central Asia had practically returned to the pre-revolution status although showing a slightly increased preference for cotton in 1927-28; in which year 38 per cent of the land was under cereals and 24 per cent under cotton as compared with 45 per cent and 20 per cent respectively in 1915.("World Production and Trade"),Int Insti. of Agri.,Rome 1936.

Table 3.- Cotton: Acreage in specified regions of the Soviet Union, annual 1928 to 1932

Year	Old irrigated regions a/		New Regions not irrigated b/	Total
	Central Asia	Transcaucasia		
	1000 acres	1000 acres	1000 acres	1000 acres
1928	2,069.2	325.2	5.7	2,400.1
1929	2,247.4	334.3	26.4	2,608.1
1930	3,153.5	395.6	361.5	3,910.6
1931	3,802.1	604.4	874.7	5,281.3
1932	3,686.5	619.2	1,061.3	5,367.0

a/In the irrigated regions, crops are, also, produced on lands that are not irrigated (bogara lands). b/ The "New Regions" are in the European Part of the Soviet Union. Cotton, as a rule, is rain grown but, just to the north of the Caucasas Mountains, irrigation is also employed in certain localities. "Selskoe Khozyaistvo S.S.S.R. 1935", p.400.

Farming was disorganized and haphazard during these years. The large landlords had been driven out and the cotton-growing farmers had taken possession of the land-holdings that, for the most part, they had farmed under the control of some local over-lord or large land-owner. The lands seized by the peasants had been sub-divided into patches and redistributed among the households of each community. 1/ Hundreds of thousands of families each cultivated independently its several little plots of ground scattered here and there in the irrigated and "bogara" lands surrounding each farming village.

Successful though the activities of the Textile Industry had been, up to 1928, to increase cotton acreage, nevertheless, it was cumbersome to make contracts with hundreds of thousands of individual small farmers. Procuring cotton and other farm products from millions of peasant homes throughout the Soviet Union proved impractical. A change in the whole farm system of Soviet Russia was inevitable.

1/This redistribution was largely one of ownership and did not materially change the average acreage cultivated by each household. In the important Fergana cotton growing district 84 per cent of the holdings had an area of 8 acres or less prior to the redistribution, and 87 per cent were in this range after the redistribution. ("National Economy of Central Asia in Figures", p.50, quoted by Lazar Volin, See footnote 4, p.1.)

In 1929-30, at the beginning of the first five-year plan period, a drive was begun to break up independent farming and to unite peasant farmers into socialized producing groups. The strip system of farming was abandoned at a rapid rate and the hundreds of tiny plots formerly farmed by individual households in each community were consolidated into a few large fields that could be tilled with power machinery, on which modern methods of agriculture could be introduced and rational systems of crop rotation could be established. These fields were then further consolidated into one or more farms per village, called "collective farms". The organization of the collective farm system, which was developed at high speed, was accompanied by a rapid expansion of acreage.

Cotton acreage in Central Asia nearly doubled between 1928 and 1931 reaching the all-time peak of 3,800,000 acres in the latter year. The peak was reached in Transcaucasia in 1932 with 619,000 acres. (Table 3.)

In order to expand the acreage of cotton in Central Asia to the degree reached in 1931, it had been necessary to give the farmers additional guaranties of an adequate bread supply. To this end, a railroad was built east and north into the wheat-surplus regions of Siberia. 1/ Government bakeries and bread shops were established in the cotton growing centers. But, inspite of the assurance of a regular bread supply, cotton acreage could not expand indefinitely. It had, already, exceeded the capacities of some local populations to successfully handle the crop at picking time and had strained the normal limits of some of the existing irrigation systems. Consequently, there was a reaction during 1933 and 1934 accompanied by a general decrease in cotton acreage (Table 4.)

1/ The "Turkish" line from Tashkent to Semipalatinsk completed in 1931. (See footnote 2, page 12.

Table 4.- Cotton: Acreage in specified regions of the Soviet Union, annual 1933 to 1936 (official) and 1937 (contracted acreage) a/

Year	Old irrigated regions		New Regions	Total
	Central Asia	Transcaucasia	not irrigated b/	
	1000 acres	1000 acres	1000 acres	1000 acres
1933	3,534.5	582.7	952.3	5,069.5
1934	3,351.2	548.8	895.2	4,795.2
1935	c/ 3,376.1	c/ 536.2	c/ 914.8	c/4,827.1
1936	c/ 3,368.0	c/ 533.7	c/1,074.9	c/4,976.6
1937	c/ 3,357.3	c/ 525.1	c/1,277.8	c/5,160.2

a/ Reported acreage under contract to be planted in 1937. b/ See footnote b/ Table 3. c/ Preliminary figure.
1933: "Selskoe Khozyaistvo S.S.S.R. 1935", p.400.
1934-35: from Posevnye Ploshtchadi U.S.S.R. Itogi Utcheta,1935",Moscow,1936,p.58.
1936: from "Ekonomika Khlopkootchistitelnoi Promyshlenosti", Moscow, 1937, p.17.
1937: from "Kontraktatziya i Zagotovka Khlopka", Moscow, 1937, pp.33-46.

During the four years 1934 to 1937 cotton acreages in the irrigated regions of Central Asia crystallized around 3,400,000 acres. In Transcaucasia, irrigated cotton acreage has shown a downward trend to about 530,000 acres in 1936 and, in 1937, contracts were reported for only 525,000 acres.

On the other hand, a remarkable development had taken place outside of the irrigated regions in the European part of the Soviet Union. Beginning with 6,000 acres in 1928, cotton acreage expanded to 1,061,000 acres in 1932 (Table 3) and then, after a check for three years, again expanded until, in 1937, (Table 4) the cotton procuring agencies of the Textile Industry are reported to have made contracts for 1,278,000 acres in the European part of the Soviet Union.

It was inevitable that cotton-growing would have to be expanded northward into Europe if the increasing demands made upon the Textile Industry for cotton goods were to be met by increased domestic production rather than by increased raw-cotton imports. In the struggle for acreage of cotton in Central Asia wheat has been almost completely crowded off the irrigated lands. To a lesser extent, in Transcaucasia the substitution of cotton for wheat had reached its practical limits, chiefly on account of lack of water readily available for irrigation.

For example, the total seeded acreage 1/ in the cotton-growing **raions** (counties) of Uzbekistan, in 1935, was 6,093,000 acres of which 3,275,000 acres were classed as irrigated land and 2,818,000 acres as "bogara" land. 2/ (Table 5.)

Table 5.- Acreages of specified crops seeded on irrigated and on bogara lands in the cotton growing **raions** (counties) of Uzbekistan, 1935

Specified crop	Irrigated land	Bogara land	Total
	1000 acres	1000 acres	1000 acres
Cotton	2,168.6	18.7	2,187.3
Alfalfa	358.5	19.6	378.1
Wheat	123.8	2,174.2	2,298.0
Other grains	410.9	549.6	960.5
Vegetables etc.	149.0	14.1	163.1
Other crops	64.0	42.2	106.2
Total	3,274.8	2,818.4	6,093.2

Compiled from official rounded totals for specified crops in Uzbekistan less the acreages of three raions which are located in high valleys and produce no cotton as published in "Posevnye Ploshtchadi S.S.S.R. (po administrativnim Raionam) 1935", Moscow, 1936, pp. 323-333.

Fully 99.1 per cent of the cotton acreage in Uzbekistan, in 1935, was planted in oases of the deserts and in foothill valleys wherever water could be obtained for irrigation; that is, 2,169,000 acres were on irrigated lands against 19,000 acres or only 0.9 per cent on bogara lands. About 66.2 per cent of the seeded acreage on irrigated lands were under cotton and only 3.9 per cent was under wheat.

About 94.6 per cent of the wheat acreage seeded for harvest in 1935 was on "bogara" lands lying on the margins of irrigated oases and upon hillsides where the assurance of a fair crop is always in doubt. Only 5.4 per cent of the wheat was seeded on irrigated lands. Nearly 97.0 per cent of available "bogara" lands in the cotton growing raions of Uzbekistan were under cereals in 1935.

1/Fall seeding in 1934 for harvest in 1935 and seeded in the spring of that year.
2/Data on acreage planted on irrigated land and on "bogara" land are not available for Transcaucasia.

Practically all of the "bogara" lands on which wheat and other cereals can profitably be grown without irrigation, under present methods of farming and distribution of population, are already under cultivation in the cotton-growing raions, not only, in Uzbekistan but in the other cotton growing centers of Central Asia as well. It is not possible to produce sufficient wheat and other cereals on these "bogara" lands to meet the bread requirement and feeding stuff needs of the populations of the cotton-growing raions.

If all of the wheat acreage that remained on irrigated lands,in 1935, / in Uzbekistan was shifted to bogara lands in order to make room for increased acreages of cotton, that increase would not affect cotton acreages more than 5-6 per cent.

The problem of materially expanding the cotton acreage in Central Asia is practically that of increasing the area of the land under irrigation. The area of the land subject to irrigation surrounding most communities engaged in the production of cotton was more or less fixed centuries ago by the acre-foot discharge of the rivers and streams from which water is drawn into the irrigating ditches as well as by the carrying capacity of the ditches themselves, Particularly is this true of those streams that are used for irrigation at their deltas where their waters are mostly consumed. (Fig.1.) The canals traversing these deltas often are crude affairs without regulators at their heads so that at flood periods larger quantities of water enter the canals than can be used for irrigation. This excess water creates swampy conditions in the lowlands. 1/

1/ "These rivers derive their water supply mainly from glaciers, but their flow is augmented by snow, which begins to melt in the lower foothills late in March. They attain a considerable volume in April, usually reaching a peak in May. As this supply declines the sun begins to make vigorous attack on the glaciers and, as the heat of summer increases, the flow from the glaciers reaches its peak, usually in July, producing the maximum water supply of the season." (Davis,Arthur Powell "Irrigation in Turkestan", Civil Engineering, Vol.2, January 1932.) The high-water period of the glacial rivers coincides with the requirements of the cotton crop, which, planted in the latter half of April or the first half of May, makes the greatest demand for water between June and September, during which time four or five separate irrigations are given. ("World Cotton Production and Trade", International Institute of Agriculture, Rome, 1936.)

There is good land, including the swamp land surrounding most of the villages and towns of Central Asia but it has been impossible to increase the irrigated area in these vacinities to any great extent by increasing the length of the canal net already constructed on account of the limited capacity of the canals to carry water or the limited and irregular discharge of many of the streams from which water is drawn. 1/ Several of the larger rivers in Central Asia carry water that has not yet been appropriated and that finds its way to the sea of Aral. There is little possibility of bringing this water onto new acreages with the irrigation systems as they exist today.

The situation in Transcaucasia is similar to that in Central Asia. Cotton acreage in these two regions can be materially increased only by extending or expanding the means of irrigating the land. There are several ways of doing this: a),- To reconstruct (widen and deepen) certain of the existing canal systems to increase their carrying capacity wherever sufficient water is available; b),- to construct retention dams for the purpose of conserving the swamp-forming water at flood periods to be released later when and as needed; c),- to build new canals from streams whose waters are not already appropriated. Much has been done,in recent years, to increase the capacity and efficiency of the existing canal systems, but this work has not as yet greatly added to the total acreage. Some work in other directions has been undertaken 2/ and there are ambitious plans for the future; but, under ordinary conditions of payment for work done, such construction has been and will be costly.

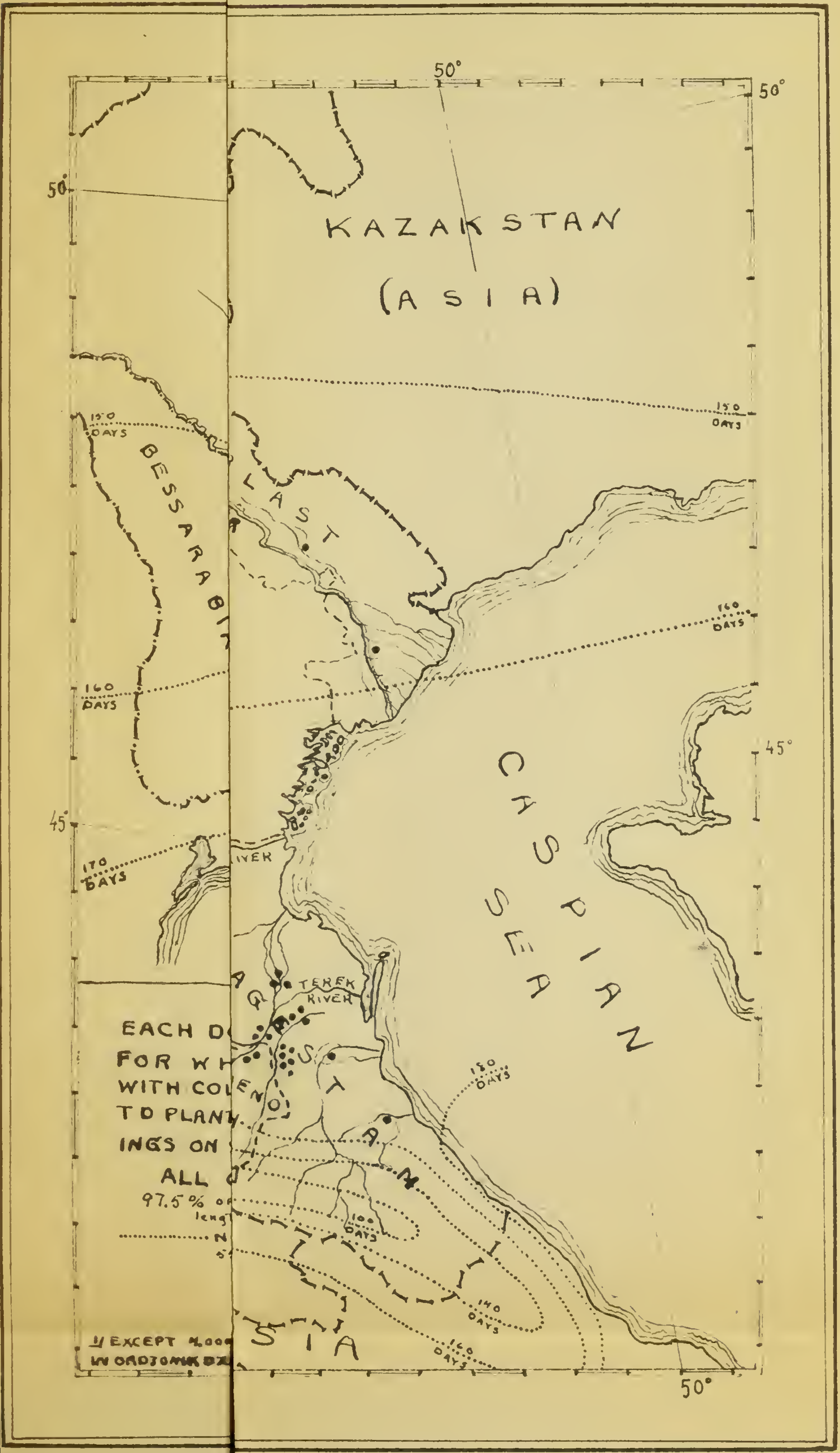
The further expansion of cotton acreage in Central Asia and Transcaucasia has become so complicated by local problems such as maintaining rational crop

---

1/"Rossiya", Vol. XIX, St.Petersbourg, 1913, pp.427-428. 2/ Among the irrigation systems that have been constructed and improved are: In Central Asia;- the Dalverzin, the Golodnia Steppe and the Chardaryin on the Syr Darya; the Chouish on the Chom and Koum Kourgan on the Sukhan Darya, and the extensive developments of the Vakhsh River system. In the lower Amu Darya, 70,000 ancient wooden wheels "Chigiss" are being replaced by modern pumping systems. In Transcaucasia;- the Little Sardarabad, the Alzan and the Tiripon systems have been constructed and the Orjonikidze canal has been built. "Soviet Geography",p.128.

SPECIAL REPOR
COTTON
SOVIET UNION

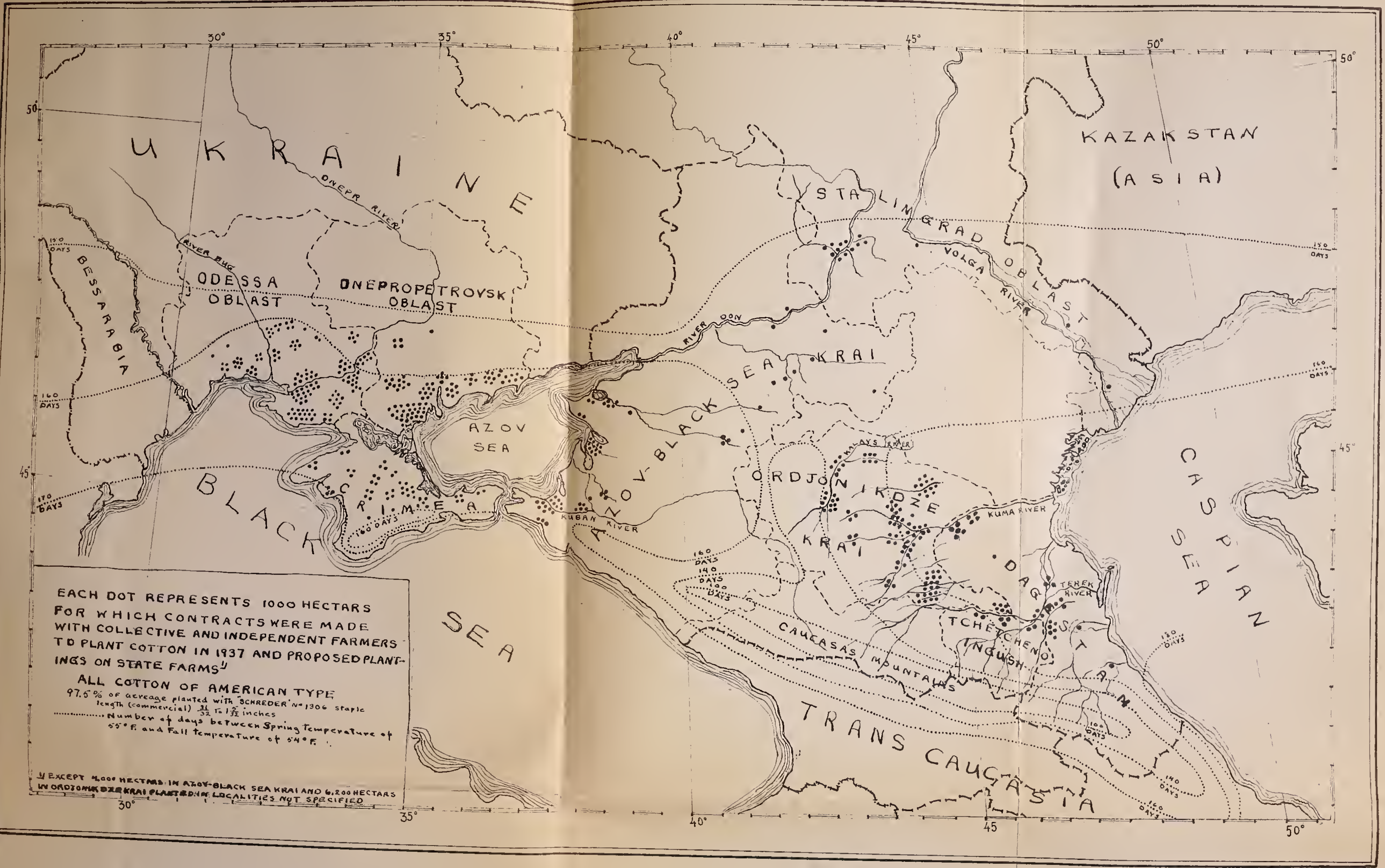
UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
FOREIGN AGRICULTURAL SERVICE
DANUBE BASIN DISTRICT.



SPECIAL REPORT NO. 336
COTTON
SOVIET UNION

"NEW REGIONS": COTTON-PRODUCING RAIONS (COUNTIES
1937

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
FOREIGN AGRICULTURAL SERVICE
DANUBE BASIN DISTRICT.



EACH DOT REPRESENTS 1000 HECTARS FOR WHICH CONTRACTS WERE MADE WITH COLLECTIVE AND INDEPENDENT FARMERS TO PLANT COTTON IN 1937 AND PROPOSED PLANTINGS ON STATE FARMS[1]

ALL COTTON OF AMERICAN TYPE

97.5% of acreage planted with "SCHREDER" No 1306 staple length (commercial) $\frac{31}{32}$ to $1\frac{2}{32}$ inches

……………… Number of days between Spring temperature of 55° F. and Fall temperature of 54° F.

[1] EXCEPT 4,000 HECTARS IN AZOV-BLACK SEA KRAI AND 6,200 HECTARS IN ORDJONIKIDZE KRAI PLANTED IN LOCALITIES NOT SPECIFIED

rotations and the matter of hand labor; as well as by the cost of the construction of the extensive irrigation works that are required; that cheaper means of increasing the acreage had to be found, and, so, "Cotton sought new regions where it might be grown without irrigation and where planting areas might be rapidly and cheaply expanded." 1/

THE NEW REGIONS

To the north of the Caucasas mountains, along the eastern shore of the Azov and Black Seas and on the northern shores of the Black and the Caspian Seas, there lies a stretch of extensive though sparcely populated, and fertile though dry, land reaching from the borders of Bessarabia to the Lower Volga. Rain is infrequent here though it falls more often than in Central Asia or in Eastern Transcaucasia. These conditions have enabled cotton acreage to be moved sharply north "from the 45th parallel to 48°15' north latitude 2/'into the so-called "New Regions."

The idea of growing cotton in Europe was no new one. As early as the XVII century, Tzar Alexis had encouraged the growing of cotton in the vicinity of Astrakhan to be used in the making of fine paper. During the 1880's, cotton was grown by certain of the great-estate owners on the plains of Dagestan north of the Caucasas mountains. Toward the end of the XIX century, experimental plantings of cotton were made in the Terek valley in North Caucasas and at Kertch in the Crimea. Before the World War sporadic plantings had been made in the Ukraine north of the Black Sea. 2/

The "New regions" offer certain advantages over the irrigated regions for the expansion of cotton-growing because tractors can be used on the unirrigated fields, as they are at present, without the reconstruction of irrigation systems

---

1/ "Soviet Geography" (See footnote 2, p.5.) 2/ "Khlopkovodstvo v Novykh Raionah S.S.S.R.", 1934. The climate is usually humid enough to permit cotton to be grown without irrigation. Precipitation is principally between May and August save in North Caucasas where the winter and early spring are the wettest. ("World Cotton Production and Trade", Int.Institute of Agriculture,Rome,1937.)

originally designed to serve small land units. The transition from an extensive system of grain-growing with fallow to growing an intensive crop like cotton has been assisted by the fact that cotton is slightly better suited than wheat to the dry climate and light chestnut soils found in the southern part of European Russia. 1/ The "New regions" are nearer to the center of the established textile industry concentrated largely in the districts around Moscow than are the irrigated regions and they are better equipped with transportation facilities. A Soviet authority states that the total area suitable to cotton in the "new regions" ranges from 7,400,000 to 8,600,000 acres, of which 30 per cent might be actually under the crop each year; that is, 2,200,000 to 2,600,000 acres. 2/ In 1937, only 1,278,000 acres were under contract to be planted to cotton in the "new regions."

Although cotton has demonstrated its superiority over cereals in some sections of the "New Regions", where it has been successfully grown, yields are markedly lower than in the irrigated districts and the quality of the fiber is poor. The growing season is relatively short and there is always greater danger than there is in the present cotton-growing centers of Transcaucasia and Central Asia that the quality of the crop will be injured by frost. Fortunately the light soils of the semi-arid districts of the "New Regions" facilitate ripening, nevertheless only the most rapidly maturing varieties of cotton of American origin have been grown with any measure of success.

The expansion of cotton acreage in the "New Regions" was rapid during the first five-year plan period, (1928 to 1932) because several localities were found that were fairly well suited to cotton-growing. That is to say, they were better suited to this purpose than most of the available "bogara" lands in Central Asia or Transcaucasia. But since these lands have been put into cotton further expansion

---

1/ "It has been estimated that 29 per cent of the years' are unfavorable to cotton, whereas 30 per cent are unfavorable to wheat which is a low-yielding crop in this zone. ("World Cotton Production and Trade", Int.Inst.of Agri. Rome,1937.)

2/ Ibid, p.65.

of acreage has been more deliberate. At the end of the second five-year plan period, experimental plantings on dozens of small areas of a few acres each were made, in 1937, as far north as the Republic of Moldovia to "feel out" the suitability of soil and climatical conditions north of the present northern boundary of the regions in which commercial plantings have been reported to be sufficiently satisfactory.

It is improbable that any marked expansion of cotton acreage in either Central Asia or Transcaucasia will or can take place until after the construction of costly irrigation works. It is probable that further expansion of acreage in the "New Regions" will follow in the wake of cautious experimental plantings. Future developments in the cotton-growing industry of the Soviet Union will probably follow lines of increasing the yields and of improving the quality of the product, rather than in any marked expansion of acreage. The basic factors determining yield are the soil itself and the degree to which its deficiencies are offset by fertilizers; the character of the seed material planted and the cultural methods applied to cope with climatic and other conditions.

SOILS AND FERTILIZERS

The irrigated lands of Central Asia consist, for the most part, of grey earths. The waters used for irrigation have brought dissolved salts from the mountains and these, for centuries, have been deposited by evaporation in the plowlands. Fully 54 per cent of the cotton lands is alkaline. 1/ The overflow waters at flood time have created alkaline meadows below the plowlands and the extreme lowlands have salty soils. Chestnut soils are found in the foothills and these merge into mountain blackearths at higher elevations. The general soil situation in Transcaucasia is roughly similar to that in Central Asia.

1/Irrigation has as elsewhere accentuated the alkali problem. In some districts of the Golodnia Steppe cotton had to be abandoned on this account after a high-yielding first year. The alkali difficulty and the moisture difficulty have both hindered the use of tractors. "World Cotton Production and Trade", International Institute of Agriculture, Rome, 1936.

The grey earths have a sufficient potash content but are low in humus and phosphorus and deficient in nitrogen. This explains the value placed on leguminous crops (Table 5) and the application of fertilizers containing phosphorus and nitrogen to soils under cotton.

In the "New Regions", most of the cotton acreage at present is found on the light chestnut earths such as those that lie between the sandy shores of the Black Sea and the black-soil belt to the north. These chestnut soils extend southward into Crimea and eastward around the Sea of Azov up into the northern Caucasas districts and Dagestan on the Caspian Sea. 1/ This region lies in the zone of light rainfall and the soils are little leached. They are low in humus and nitrogen. Most of them respond to phosphorous and, although, as a rule, there is not a deficiency of potash, this fertilizer can be applied to some soils with profit. In certain parts of the "New Regions" (Azov-Black Sea, Ordjonikidze , Dagestan) alfalfa makes satisfactory growth and is being introduced as a predecessor to cotton in the rotation. But the Southern Ukraine is marginal for the use of this legume, particularly as a forerunner to cotton; therefore, greater dependence has to be placed on commercial nitrogen and barn-yard manure.

In most of the cotton growing regions of the Soviet Union, barn-yard manure, mixed with straw and dried in dabs stuck on the sides of houses, is used as fuel. These are steppe and desert regions. There are few trees and wood is scarce. Therefore, the great slaughter of livestock between 1928 and 1932 nearly eliminated the use of barn-yard manure as a fertilizer because the fuel supply of the farmers had to be maintained. In 1932, local manures were applied to only 15.2 per cent of the cotton lands of Central Asia and Transcaucasia. (Table 6.)

1/ Whereas, these soils are generally not prohibitive to the production of cotton, nevertheless practical success has been attained only in spots of rather limited area. Tentative plantings are being made (1937) on small acreages throughout Southern Ukraine, in the Southern part of the Black-soil Belt, in the Lower Volga region and southward to the Caucasas mountains to determine which soil and temperature zones will successfully produce cotton under local precipitation conditions. It is impossible to give a brief description of the multidious variety of soil types and fertilizer requirements of this vast region.

Table 6.- Cotton: Percentage of acreages fertilized and quantities of specified fertilizers used in Central Asia and Transcaucasia 1932 to 1935

Year	Percentage of planted acreage fertilized			Nitrogen fertilizers applied (In terms of 20 per cent ammonium sulphate)	Phosphoric fertilizers applied (In terms of 14 per cent superphosphate)
	Mineral fertilizer	Local manure	Total		
	Per cent	Per cent	Per cent	Short tons	Short tons
1932	4.9	15.2	20.1	15,700	37,900
1933	3.4	43.5	46.9	9,400	29,500
1934	27.4	31.8	52.9	97,500	161,500
1935	37.2	31.6	68.8	a/137,300	a/234,700

a/Total quantity of these fertilizers used in the U.S.S.R. in 1935 was 1,255,700 short tons phosphoric and 375,780 short tons nitrogeneous. (Ibid). That is, more than 60 per cent of all nitrogeneous commercial fertilizers was applied to cotton fields.

"Selskoe Khozyaistvo S.S.S.R. 1935", Moscow, 1936.

Under the stimulus of the contract system of cotton-growing, the percentage of the acreage of cotton lands that were fertilized increased in the irrigated regions more than three times from 20.1 per cent in 1932 to 68.8 per cent in 1935. The use of local manures, which the peasants have to supply for themselves and which are scarce, decreased during 1934-35. The percentage of the acreage fertilized was only 31.6 per cent of the total in 1935 although double that of 1932. Commercial fertilizers, on the other hand, are sold to cotton farmers through the procurement agencies of the Textile Industry which are able to specify in the contract how much and what fertilizers shall be used. In Central Asia and Transcaucasia the application of nitrogeneous mineral fertilizers in terms of 20 per cent ammonium sulphate increased from 16,000 short tons in 1932 to 137,300 short tons in 1935. The use of phosphates in terms of 14 per cent superphosphate increased from 38,000 short tons in 1932 to 234,700 short tons in 1935.

There is no record of the quantities of fertilizers used in the "New Regions". Though their application has probably not been as general as in the irrigated regions, nevertheless, fertilizers have aided materially in increasing yields in the European cotton zone. It is impossible to attribute the spectacular improvement in yields in the Soviet Union during the last few years to any single factor but it is certain that the selection of seed material best suited to local conditions of soil and climate and the reorganization of the whole agricultural system have played a very important part.

SEED MATERIAL, REORGANIZATION AND YIELDS

Before the World War, the yield of cotton in the former Russian Empire; that is, in Central Asia and Transcaucasia, averaged (1913) about 310 pounds of lint per acre (Table 7.)

Table 7.- Cotton: Acreage, production and yield in the Soviet Union; Annual 1913; 1922; 1928; 1932 to 1936 and acreage under contract to be seeded in 1937

Year	Acreage	LINT	
		Production	Yield
	1000 acres	a/ 1000 bales	Pounds per acre
1913	1,700.0	1,104	310
1922	173.7	31	85
1928	2,400.1	1,129	225
1932	5,367.0	1,790	159
1933	5,069.5	1,891	178
1934	b/ 4,795.2	1,716	171
1935	b/ 4,827.1	c/ 2,500	c/ 248
1936	c/ 4,976.6	c/ 3,556	c/ 342
1937	d/ 5,160.2	--	--

a/Bales of 478 pounds. b/ Acreage 1934-35 from "Socialist Construction U.S.S.R. 1936." c/Preliminary. d/Acreage for which contracts were let. From "Kontraktaziya i Zagotovka Khlopka", Moscow, 1937, p.31.

1913-36 except as noted compiled from data in "The Economics of the Ginning Industry" (Ekonomika Khlopkootchistitelnoi Promyshlenosti") Moscow, 1937, p.16.

When the years of want attending the World War, the revolution and civil strife forced cotton out of cultivation in Central Asia, as noted above, the peasants turned their attention to the production of food-stuffs. Some cotton continued to be grown in small patches for use in household industry, for padding of winter garments, for stuffing cushions and quilts, for thread, twine and rope, just as in the days of Genghis Khan. But the commercial cotton-growing industry had ceased to exist. The landed proprietors, who had been interested in their tenants producing high-grade cotton, had been driven out and the buyers for the big textile mills in European Russia, who had been interested in supplying growers with improved cotton seed, no longer operated. The peasants planted such seed as came to hand paying little attention to yield and having little or no appreciation of the significance of varieties in their relation to yield and quality.

To them cotton was cotton. Methods of cultivation had always been poor and these coupled with poor seed-material resulted in the average yield, in 1922, reaching only 87 pounds of lint per acre.

At the beginning of the reconstruction period (1922), the Procurement Division of the Soviet Textile Industry distributed to growers under the contract system such seed of high quality as was available. 1/ During the succeeding years, breeding stations, specializing in cotton, concentrated on the production of new high yielding strains specially adapted to specific local conditions. 2/Several such strains were developed, although their influence on yields was not fully realized because of the poor farming methods employed. Up through 1928, most of the agricultural practices were the primitive methods of the ancient strip-system of farming based on customs and habits handed down from father to son with little modification. Although a beginning had been made to influence farm activities through advice given by agronomical agents operating in various production centers, results were not markedly evident. In spite of handicaps, however, yields in 1928 averaged 224 pounds of lint per acre; which was, nevertheless, 86 pounds below the 1913 average of 310 pounds per acre. (Table 6.)

During 1928 to 1932, (the first-year plan period) yields declined sharply. The reason for this was that Soviet agriculture was in the experimental stage of "socialized farming". 3/ The ancient strip system of farming was in the process of being abandoned. The most skilful farmers- the Kulaks - were being driven out.

1/S.A. Djanumyan reports ("Economics of the Ginning Industry", Moscow, 1937, p.11) that,in 1921, there were only about 18 short tons of seed of the variety "Navrotzky" developed in 1913 from the American type "Russell"and even less of other standard varieties. 2/Several strains developed during this period have been discarded. Among the varieties that have survived and were specified in contracts made in 1937 are "Schreder" 1306 from "King", medium stapled 8517 from "Acala" and medium stapled 2034 from"Express Webber." 3/In 1928, only 1.7 per cent of the farming households in the Soviet Union were socialized. By June 1,1932, socialization included 61.5 per cent of the households. There were 211,100 socialized farming groups of which 2 per cent were communes (both means of production and products of labor were socialized); 95.9 per cent were "artels"; (only the means of production were socialized. Products of labor were distributed on the basis of the quantity and quality of the work performed by each individual); 2.1 per cent were "brotherhoods" in which groups united to perform certain work.

The hundreds of small plots of land surrounding each village were being consolidated into a few large fields and turned over to the former landless peasants, to the poor-class of peasants (the rural proletariat) and to the middle-class peasants for exploitation. The more skillful upper-class peasants often either withheld their advice or were not heeded. 1/ There were inadequate numbers of agronomic advisors (county agents) to handle the situation, and few of these had had any experience in large scale farming.

Although the enthusiasm of the lower classes of peasants added many acres to the collective farm system, the new "collective farmers" were unaccustomed to the recently initiated order of agriculture. Thousands of acres were on marginal "bogara" land in the irrigated regions. Furthermore, by 1932, nearly 20 per cent of the cotton acreage had been extended into the unirrigated regions of Southern Europe, where farmers had had no previous experience in growing this crop and where, in many localities, it was impossible to obtain high yields on account of the shortness of the season and light rainfall.

Large numbers of farm animals had been slaughtered, between 1928 and 1933, and livestock numbers in the Soviet Union were reduced from nearly 277,000,000 to about 117,000,000. 2/ There were not enough draft animals on farms to supply the needed traction. The Government then organized Machine and Tractor Stations (M.T.S.) in the chief production centers and threw hundreds of tractors into the cotton growing regions. 3/ However, the tractor drivers, (hastily trained members of collective farms) had not yet acquired the desired operating skill. Attempts were made to direct agricultural operations from

---

1/For a vivid picture of this period see "Upturning of the Soil", Moscow.
2/"Tchislenost Skota v S.S.S.R. na 1 Yanvarya 1935 g." Moscow, 1935. These figures compare with 238,500,000 total livestock in 1916. Although the "plan" for livestock numbers on June 1,1936 was exceeded by more than 2,000,000, the flocks and herds of the Soviet Union numbered only 137,276,000 on that date (about 100,000,000 less than before the revolution.) "Tchislenost Skota v S.S.S.R." Moscow,1936.) 3/ In 1930, there were 17 M.T.S. with 1,208 tractors specializing in aid to cotton growing in Transcaucasia, Uzbekistan, Turkmenistan, and Tadjikstan. In 1932, the number of M.T.S. specializing in cotton production had increased to 158 with 5,700 tractors.

centers at too great distances from local activities and serious mistakes were made. Yields per acre suffered during this haphazard, experimental stage and, in 1932, the average yield of cotton was barely 159 pounds of lint per acre or only slightly more than half of the 1913 yield.

Although yields in 1932 and 1933 were low, acreage was sufficiently high to produce enough cotton to cover 95 to 97 per cent of the requirements of the textile mills (Table 1.) It was obvious that, if acreage could be maintained and if yields could be brought up to the pre-revolution level, production could be nearly doubled. It was well within possibilities to increase the low yields then obtained and, during the second five-year plan period (1933-37), a drive with this purpose in view was instituted.

In order to fortify the position of the seed-material used as a factor in determining yield, four scientific cotton-breeding stations have recently been given charge over all cotton breeding operations 1/ in four specified regions: The Tashkent Station for Central Asia; the Kirov Abad Station 2/for Transcaucasia, the Kherson station for the Ukraine and the Khazov Yourt station for the rest of the European part of the Soviet Union. These central stations controled (1937) a net-work of sub-stations and testing fields scattered throughout their territories.

By 1936, the cotton growing **raions** (counties) had been grouped into fairly well defined zones, based on conditions of soil and climate. The central stations and their sub-stations endeavored to select new strains of high yielding cotton from known standard varieties that would be best adapted to each climatic and soil zone, as well as to create new varieties by selection and hybridization. Many varieties have been imported from abroad and tested. Certain varieties that had been popular and widely distributed have been discarded as they have proved, in the

---

1/All cotton breeding work eventually heads up in the Commissariat of Agriculture in Moscow. 2/Both Tashkent and Kirov Abad stations are of long standing.

variety testing plots scattered throughout the cotton growing regions, to be inferior to newly created strains.[1] In 1936, the Textile Industry specified in its contracts and undertook to distribute to each of the farming groups and independent farms the particular variety of seed that was considered, at the time, best adapted to the zone in which the farm was located.

Not only did the textile industry undertake to control the seed material used on each farm; but through the local officers of its procurement division, operating in cooperation with the civic administrative authorities of each cotton-growing raion (county), it undertook to control the fulfillment of the contract agreement in each separate phase of field work,- the actual areas seeded to cotton, the quality of winter and spring plowing, the date of seeding, the quality and quantity of fertilizer used and the dates when applied, the thinning of young plants, the inter-row cultivation and hoeing in the rows, the dates of irrigation and quantity of water used, the proper timing of cultivation to irrigation[2] and the methods of combatting diseases and insects. The mills controlled the proper organization of cotton harvesting and took steps to insure that picking should be done on time and that the cotton be separated into raw-cotton grades at time of picking. They furnished the bags into which the weighed seed-cotton was stuffed for delivery, took active part in the organization of the delivery of the cotton to the nearest procurement points, and attempted to prevent losses of cotton during delivery.[3]

---

[1] During the second five-year period (1928-32) several superior varieties were developed No.114 from "Dekhkan", No.491 from "Acala"; No.36 M-2 from "Acala". These varieties were released for general distribution during the second five-year plan period and have had an influence on yield. Other varieties of recent origin are still in the variety-test stage and will be released if, and as soon as, they prove to be superior to strains already in use.

[2] Most of the soils on which cotton is planted form a heavy crust upon drying after irrigation. This crust has to be broken up within a reasonably short time.

[3] Djanumyan, C.A. (Ibid, footnote 1, page 3.)

The care exercised in supplying good seed has had an undisputable effect upon production and yields in recent years. The control measures adopted by the Government to insure increased use of fertilizers and the application of better production practices have played their necessary part. But, important as these factors have been, it must not be overlooked that there has been a marked development in the skill of the farmers themselves. Each farm group has been divided into brigades and each brigade works throughout the season on a measured area which stimulates competition between brigades. The accomplishment of each brigade is posted on a bulletin board. Industrious brigades are awarded premiums and laggards are penalized. Most farm operations are performed on a price-work basis and the record of each worker is posted by his brigade leader. This has resulted in the development of experts called "Stakhanovists" the accomplishments of the best of whom are published and broadcasted throughout the Soviet Union.

The cumulative effect of all these improvement factors had a marked influence on the 1936 cotton crop; in which year 4,977,000 acres are reported to have produced 3,556,000 bales (Table 8) or 342 pounds of cotton to the acre; that is, 32 pounds more per acre than in 1913. This 1936 yield per acre, although a preliminary figure subject to being scaled downwards, is interesting because it is the average of all cotton grown in the Soviet Union including the low yielding "New Regions" that produced an average yield of only 75 pounds per acre in 1936; whereas, the 1913 figure is based only on the cotton produced in the higher yielding irrigated regions of Central Asia and Transcaucasia.

If the 1936 average yields for Central Asia and Transcaucasia are calculated separately, there are indications (Table 8) that the 1936 yield in these two regions averaged 415 pounds of lint per acre or nearly 34 per cent higher than the 1913 average.

Table 8.- Cotton: Acreage, production, (seed-cotton and lint) and yield per acre in specified districts of the Soviet Union in 1936

Region and district	Acreage	Production		Yield per acre
		Seed-Cotton	Lint 1/	
	1000 acres	1000 S.tons	1000 bales	Pounds
	IRRIGATED	REGIONS		
Central Asia				
Uzbekistan	2,185.6	1,597.7	2,179.3	476.6
Turkmenistan	379.3	216.4	295.1	372.0
Tadjikistan	257.0	156.2	213.0	396.3
Kazakstan	269.3	116.8	159.4	282.9
Kirgizia	158.1	88.0	120.0	362.8
Kara Kalpak	118.6	58.9	80.3	323.6
Total Central Asia	3,367.9	2,234.0	3,047.1	432.5
Transcaucasia				
Azerbaidjan	478.2	219.9	300.0	299.8
Armenia	44.5	24.8	33.8	363.4
Georgia	11.1	4.1	5.6	239.6
Total Transcaucasia	533.7	248.8	339.4	303.9
Total Irrigated regions	3,901.6	2,482.8	3,386.5	414.9
	REGIONS NOT	IRRIGATED		
"New Regions"				
Ukraine	467.0	71.2	97.2	99.4
Ordjonikidze and Dagestan 2/	395.4	21.5	29.3	35.4
Azov-Black Sea and Stalingrad	133.4	22.4	30.5	109.4
Crimea	79.1	9.0	12.3	74.5
Total "New Regions"	1,074.9	124.1	169.3	75.3
Total SOVIET UNION	4,976.6	2,606.9	3,555.8	341.5

1/Converted on the basis of an average ginning yield of 32.6 pounds of lint to 100 pounds of seed-cotton. It is probable that the ratio of lint to seed cotton was higher in the irrigated regions than in the "New Regions" where cotton is almost exclusively rain grown. 2/Former North Caucasus.

Compiled from "Ekonomika Khlopkootchistitelnoi Promyshlenosti", Moscow, 1937.

By the end of 1936, yields had been sufficiently increased to produce, on the acreage planted in that year, more than enough cotton to cover the requirements of the textile industry as planned for 1937. (Table 1.) This achievment was due, in no small degree, to the skill that collective farmers had acquired in large scale farming. But a large part of the achievment is to be attributed to the close supervision maintained over the activities of collective farms and independent farmers by the Textile Department of the Commissariat of Light Industry, cooperating with local civic authorities and with the agencies of the Commissariat of Agriculture.

GOVERNMENT CONTROL OF COTTON-GROWING.

The civic authorities of each raion (county) in the Soviet Union have actual supervision over all agricultural activities within their respective raion. A representative of the raion (county) council (Raispolkom) is a witness to each contract that the agent of the Textile Industry makes with each cotton-growing collective farm located in his raion. 1/ This contract which "contains a complex of obligatory and necessary requirements as to production", has been given "the force of a law" 2/ and any violation of its terms subjects an independent farmer or a collective farm group to legal prosecution and punishment. Thus, advice offered by the agronomic division of the raion civic administration has, within the terms of the contract, the force of a command to be obeyed. The actual routine work of directing the farming activities of collective farmers, however, is performed, largely, by the agronomic section of the local machine and tractor station (M.T.S.) one or more of which operate in each cotton-growing center.

1/Contracts with independent farmers are witnessed by a representative of the village council (Soviet) as well as by the agent of the Textile Industry. The village council has general oversight over the fulfillment of such a contract signed by the independent farmer. 2/ Djanumyan, C.A. (Ibid, footnote 1, page 2.)

THE ROLE OF MACHINE AND TRACTOR STATIONS 1/

The Government owned and operated Machine and Tractor Stations have been powerful factors in the organization of many collective farms, and in the direction of their policies. The Machine and Tractor Station has three sections: The mechanical, the agronomic, and the political. A specialist appointed and employed by the Soviet Government is in charge of each section.

The Machine Section of M.T.S. enters into contract with a collective farm for the performance of certain farm work - plowing, harrowing, seeding, cultivating , harvesting, thrashing etc. The personnel of the machine section do not actually perform the work done. The section supplies the tractors, oil, gasoline, plows, harrows, seeding machines, cultivators, harvesters etc, to the collective farm but these machines are operated by members of the collective farm who receive their wages from such farm. The farm pays the M.T.S. a certain percentage or quantity of the crop per acre for the use of each machine employed in each farm operation. A Machine and Tractor Station does not serve all the collective farms in its district 2/ nor does it supply tractors and machines to do all the work on any particular collective farm (See Table 8) because each farm has a certain, though varying, number of draft animals and machines of its own.

1/Several M.T.S. are serviced by a district Machine and Tractor Repair Station with which they are hooked-up by telephone. The M.T.R.S. are hooked-up by telephone with the Republic, Oblast or Krai M.T.S. Bureau and these in turn with the M.T.S. administration in Moscow; which is thus able to rapidly issue orders and receive reports. 2/ Some of the collective farms are remote from a station or located in hilly country where it is not possible to operate power-drawn machinery.

Table 8.- Farm operations performed by M.T.S. machines: Percentage of the total acreage plowed, seeded and cultivated in specified republics, of the Soviet Union in 1936

Republic	All crops plowed		All crops seeded		Cotton	
	Fall	Spring	Fall	Spring	Seeded	Cultivated
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Uzbekistan	77	74	22	16	26	17
Turkmenistan	a/	80	15	20	25	15
Tadjikstan	25	35	1	7	31	15
Kirgizia	91	39	35	13	30	18
Azerbaidjan	42	57	18	37	70	43

"M.T.S. i Kolkhozy v 1936 god.", Moscow, 1937.

Thus, in 1936, the 9,810 collective farms in Uzbekistan planted 2,149,000 acres of cotton of which only 567,000 acres, or 26.4 per cent, were seeded by machinery furnished by M.T.S. The machines rented from M.T.S. were used to cultivate only 17 per cent of the total number of acres of cotton cultivated in Uzbekistan in that year. By far the greater part of each of these operations was performed with implements drawn by the horses, oxen and camels belonging to the collective farms themselves. On the other hand, heavy work such as plowing was largely done with tractors supplied by M.T.S.; 77 per cent of 827,700 acres of the fall plowed land seeded to winter wheat and other winter crops and 74 per cent or 3,163,600 acres of the plowed land seeded to spring crops. 1/ In the congested cotton growing districts of Central Asia and Transcaucasia a large percentage of farm operations is performed by hand and by animal-drawn implements. There is a question as to the extent to which farm operations should be mechanized and hand workers thrown out of farm-employment and made available to other industries. This is particularly true in the case of the cotton-growing districts where a large amount of hand labor should be available at picking time. 2/ This problem is not so acute in a region of extensive cereal production as Azov-Black Sea Krai where machines from M.T.S., in 1936,

---

1/ "M.T.S." i Kolkhozy v 1936 godu", Moscow, 1937, p.545. 2/ The mechanization of cotton picking has not, as yet been attended with the results desired by Soviet Authorities. Much work is being done to perfect a picker suited to Central Asiatic conditions but at the end of 1937 most of such cotton-picking operations were in the experimental stage.

did 94 per cent of the plowing on which winter crops were seeded; 77 per cent of the plowing on which spring crops were seeded; 77 per cent of the fall seeding, 65 per cent of the spring seeding and harvested 78 per cent of the grain acreage.1/

The Agronomic Section of M.T.S. supervises all farm operations of collective farms that rent machinery from the Government-owned Machine and Tractor Stations. In the Kherson Raion (county), Odessa Oblast of the Ukraine, there are three Machine and Tractor Stations each of which has a staff of 10 agronomists. 2/ There are 83 collective farms served by these three stations so that each field agronomist supervises the work of 2 or 3 collectives. In 1935, these collectives planted about 189,000 acres or some 2,300 acres per collective farm. Each agronomist, acting as a Government overseer, thus supervised the work done on from 4,000 to 7,000 acres. The cotton-growing collectives in Kherson Raion planted 23,400 acres of cotton in 1935. In that year, M.T.S. and the Raion Council, in collaboration with the agent of the textile industry, determined which collectives were to grow cotton, the particular fields upon which cotton was to be grown, the extent of the acreage, and all other details from the preparation of the soil to the final delivery of the raw cotton to the procurement point. During the season, the thirty agronomists of M.T.S., acting under the general direction of the head agronomist of the Raion Council, supervised every detail of the cotton production on these farms.

1/"M.T.S. i Kolkhozy v 1936 godu", Moscow, 1937, p.35. 2/ During the first five-year plan period (1929-32) there was a shortage of technical skill in the operation of large-scale farms. Although much is still to be desired in the manner in which these farms are operated, nevertheless, progress has been made during the past ten years. Particularly is this true of the progress made in the agronomic personnel. Many of the existing Agricultural middle schools, colleges and institutes (universities) have been enlarged and new institutions established so that today hundreds of additional young men and women with four or more years training are being set to work each year in the farm centers. L.G.M.

Among the fulfillment of other duties, the Political Section of M.T.S. supervises the political activities of the membership of each collective farm served by each station. At the beginning of the collectivization of agriculture in the Soviet Union, a party-nucleus was organized out of the village proletariat;- the landless peasants, the poor peasants, without sufficient land to support a family, the lower middle class peasants and certain elements among the upper class peasants. They formed a working majority in practically every farm center. Their activities, at first revolutionary, were later directed along other lines. To-day a group similar to the party-nucleus on the collective farm possesses the voting strength to determine all farm policies and pass upon all plans for farm organization, operation and administration. "Cotton-growing collective farms receive help along the line of their organizational and planning work as well as in their field work and harvesting work." 1/"These stations (M.T.S.) provide the collective farms with technical and organizing help and are the economic and political organizers of agriculture." 2/

The growth of this powerful system for the "economic and political" organization of Soviet agriculture has been a steady one from 158 Government-owned "Tractor Centers" 3/, in 1930, to 2,502, in 1932, and to about 5,000 in 1936. 4/ There were 17 stations specializing in cotton in 1930 against 452 in 1935. 3/ The total number of tractors in all stations at the end of 1936 was 341,000, of which 30,000 were of the "universal" type. 5/ Auxiliary power machinery numbered 289,000 plows, 120,000 seeders and 47,000 cultivators. 6/ These machines were used in servicing 83 per cent of the seeded acreage of 67 per cent of the collective farms of all types in the Soviet Union in 1936. 7/

1/Djanumyan, S.A. (See footnote 1 p.2.) 2/Mikhaylov,N., "Soviet Georgraphy", Methnen & Co.Ltd., London, 1935, p.116. 3/"Socialist Construction in the U.S.S.R.", Moscow,1936. There were also 479 cooperative Machine and Tractor Stations in 1930. 4/"M.T.S. i Kolkhozy v 1936 godu", Moscow, 1937. 5/ In the early application of power to Soviet farm operations, great difficulty was experienced in the use of tractors to cultivate row-crops. In recent years this difficulty is being met by the use of the light "universal" type of tractor. 6/ In addition to the above inventory the M.T.S. in 1936 were equipped with 66,000 combines, 112,000 thrashing machines, 765,000 horse drawn seeders, 916,000 harvesters and 78,000 trucks.(M.T.S. i Kolkhozy v 1936 godu",Moscow,1937.) 7/M.T.S. i Kolkhozy v 1936 godu,Moscow,1937, p.9.

COTTON FARMS

In 1935, the Soviet Union planted 4,827,100 acres of cotton of which 4,299,300 acres or 89.1 per cent were planted on collective farms by the collective group. State farms, owned and operated by the Government, planted 245,100 acres or 5.1 per cent and independent farmers (non-socialized sector) planted 5.8 per cent or 282,000 acres. 1/

Collective farms in different parts of the Soviet Union vary greatly in their relative size and in the relative acreages planted to cotton and other crops.

Table 9.- Collective farms: Relation of numbers to households and acreage in specified Republics and Oblast in the Soviet Union in 1936

Specification	Odessa Oblast a/	Republic of Azerbaidjan	Republic of Uzbekistan
Number of farms	4,212 number	3,611 number	9,180 number
Number of households	374,000 "	289,300 "	642,500 "
Number of households per farm	89 "	80 "	70 "
Acreage harvested	8,371,000 acres	2,282,000 acres	5,811,000 acres
Acreage per farm	1,987 "	632 "	633 "
Acreage per household	22.4 "	7.9 "	9.0"

a/In the South part of the Ukraine on the Black Sea.
"M.T.S. i Kolkhozy v 1936 godu," Moscow,1937.

In the grain-producing oblast of Odessa, in the southern Ukraine, on the northern margin of the cotton belt of the "New Regions", cultivated lands stretch away continuously for hundreds of miles dotted here and there with farming villages. Collective farms averaged nearly 2,000 acres each in 1936. (Table 9.) There were, on the average, 89 households to each farm resulting in an average of 22.4 acres of seeded fields to each household. Agriculture is extensive in this Oblast and a large part of all farm operations is performed with machinery supplied by the Machine and Tractor Stations. In Azerbaidjan (Transcaucasia) and in Uzbekistan, (Central Asia) the population is, for the most part, crowded onto the limited plow-lands of oases scattered in the deserts where fields are irrigated.

Farming villages also occur in occasional valleys or upon hill sides where there is sufficient rainfall to furnish a precarious existence. There is usually a stretch of desert or unutilized land between villages or groups of villages. Collective farms are small, averaging 632 to 633 acres of seeded fields each; that is, 70 to 80 households farm less than a square mile of acreage under crops. There is, on the average only 8 to 9 acres of crops per family. 1/

Scattered here and there among the collective farms, 48 Government- owned and operated State farms specialized in cotton in 1935. 2/ These farms were intended to serve as examples of modern technique as applied to large-scale farming. They,also, produced pure-bred seeds and animals for distribution among collective farms.

Scattered here and there among the collective farms, are the holdings of the few independent farmers who have resisted collectivization and prefer to pay high taxes and to undergo other inconveniences rather than to relinquish their individual activities.

There is still another group of tillers of the soil. Under certain conditions, workers in factory towns, and other laborers not members of collective farms are assigned garden plots in the vicinity of the localities in which they live. 3/

The acreage seeded in 1935 in three selected cotton-growing districts was distributed among these five groups of land holdings as indicated in Table 10.-

Table 10.- Acreage seeded on various types of land-holdings in specified districts of the Soviet Union in 1935

Kind of land holding	Kherson Raion Odessa Oblast Ukraine		Salyan Raion Azerbaidjan Transcaucasia		Sokh Delta 1/ Uzbekistan Central Asia	
	Acres	Per cent	Acres	Per cent	Acres	Per cent
Collective farms	185,419	74.3	77,260	87.6	196,217	94.7
Collective farmers	4,040	1.6	--		4,927	2.4
State farms	56,351	22.6	7,427	8.4	3,254	1.6
Independent farms	902	0.4	3,503	4.0	2,708	1.3
Factory and other workers	2,676	1.1	--		67	0.0
Total	249,388	100.0	88,190	100.0	207,173	100.0

1/See Fig.1. "Posevnye Ploshtchadi S.S.S.R. po administrativnim raionam."Moscow,1936.

1/In addition to the fields farmed by the collective group, each household in most localities has a small plot of land for a kitchen garden. 2/In the "New Regions",15; in Azerbaidjan, 7;and in Central Asia, 26.("Selskoe Khozyaistvo S.S.S.R.1935",Moscow, 1936. 3/No cotton is produced by this group.

There was insufficient local population to properly cultivate the soil of Southern Russia; where, before the revolution, many large estates were worked by labor imported from the northern congested districts. There were several such large land properties in Kherson raion and, today, the Government operates some of these former large estates as State farms. The "county-seat" of this raion is the manufacturing city of Kherson so that considerable land was utilized for the gardens of factory workers. Only a few real farmers operated independently in 1935. Collective farms and gardens of collective farmers occupied 75.9 per cent of the seeded areas.

In the Sokh Delta 97.1 per cent of the seeded area in 1935 was tilled by collective farmers. State farms occupied only 1.6 per cent of the land against 22.6 per cent in Kherson and 8.4 per cent in Salyan. Independent farmers on the Sokh delta tilled 1.3 per cent of the seeded area in 1935; against 4.0 per cent in Salyan raion and only 0.4 per cent in Kherson raion.

There is a wide range in agricultural practices being pursued in the cotton-growing districts of the Soviet Union as illustrated by the areas seeded to specified crops on all types of farms in 1935 in three selected cotton-growing raions.

Table 11.- Utilization of the seeded area in three selected cotton-growing raions (counties) of the Soviet Union in 1935

Crop	Kherson Raion Odessa Oblast Ukraine		Salyan Raion Azerbaidjan Transcaucasia		Kokand Raion a/ Uzbekistan Central Asia	
	Acres	Per cent	Acres	Per cent	Acres	Per cent
Grain	172,589	69.2	b/44,992	51.0	7,240	13.0
Sunflower	4,324	1.7	--		--	
Vegetables	25,086	10.1	474	0.5	2,577	4.6
Cotton	23,398	9.4	c/38,083	43.2	c/41,989	75.3
Alfalfa	1,532	0.6	4,668	5.3	3,970	7.1
Other feed and forage	21,839	8.8	5	0.0	5	0.0
Other crops	620	0.2	5	0.0	20	0.0
Total	249,388	100.0	88,227	100.0	55,801	100.0

a/Kokand raion comprises the farm lands surrounding the city of Kokand in the Sokh delta. (See Fig.1.) b/ Most of this grain was grown on unirrigated ("bogara") land not suitable for cotton. c/ All of this cotton was grown on irrigated land.

Same as Table 10.-

In the Kokand raion of Central Asia, 83.4 per cent of the irrigated area was under cotton and alfalfa and only 13.0 per cent under grain; (Table 11) whereas, in Kherson raion 69.2 per cent was under grain and only 10.0 per cent under cotton and alfalfa. In Transcaucasia an intermediary course was being followed with a little more than half the area under grain and a little less than half under cotton and alfalfa. Alfalfa is mentioned in connection with cotton because Soviet authorities have recently placed much emphasis on the use of alfalfa as a rotation crop to build up cotton yields.

CROP ROTATIONS

The utilization of the plow-land and consequently the rotation of crops varies greatly in the various regions where cotton is grown. A few examples are given to illustrate the diversity in the systems employed. On the northern fringe of the "New Regions" cotton is injected into a rotation of cereals:- 1) Fallow; 2) Winter wheat; 3) Spring grain; 4) Cotton; 5) Winter wheat; 6) Potatoes and spring grain. 1/Farther south, near the Azov Sea, cotton is sandwiched between cereals and alfalfa:- 1) Cotton; 2) Winter wheat; 3) Cotton; 4) Barley and oats; 5) Cotton; 6) Winter wheat; 7) Alfalfa. 2/ On the irrigated lands of the "Golodnia Steppe" in the southern part of Kazakstan, Central Asia, the State Farm "Pakhta-Aral" practiced the following crop rotation: 3/

I.-	Alfalfa	Ist	year	without fertilizer	
II.-	"	2nd	"	P205 + 74 lbs. per acre	
III.-	"	3rd	"	P205 ÷ 74 " " "	
IV.-	Cotton	Ist	"	P205 ÷ 52 " "	
V.-	"	2nd	"	P205 + 52 " " "	
VI.-	"	3rd	"	P205 ÷ 29 " " "	÷ N 80 lbs. per acre
VII.-	"	4th	"	P205 ÷ 47 " " "	÷ N107 " " "

A similar rotation is reported to be in use in Uzbekistan and Azerbaidjan where three years of alfalfa are followed by four to six to eight years of cotton.

1/"Budyona" Collective farm, village Antonovka, raion Kherson, Oblast Odessa, Republic Ukraine, There is no alfalfa in this rotation. The Kherson cotton Experiment Station is trying out: 1) Fallow; 2) Winter wheat; 3) Cotton;4)Alfalfa;5) Alfalfa;6)Alfalfa;7)Spring grain;8)Cotton;9)Winter wheat;10)Winter wheat. 2/"Red October" collective farm,village Stara Titerovska,raion Temruk,krai Azov-Black Sea. 3/"Pakhta Aral v 4 Zavershenstchem",1932,p.15.

TILLAGE METHODS

As a rule, in the "New Regions", where moisture conservation is imperative, all land to be planted to cotton in the spring is shallow plowed after the harvesting of the crop the previous summer. Later in the fall the land is plowed from 8 to 10 inches deep. Power drawn plows furnished by the Machine and Tractor Stations are used for most of this work.

On collective farm "Red October", in Azov-Black Sea Krai, fields were harrowed twice in March 1937. A mixed fertilizer was then applied (160 pounds per acre) and the land was plowed 4-5 inches deep. In April, the fields were cultivated and then seeded with 62 pounds per acre (26-28 inches between rows). Later the plants were thinned to 4-6 inches in the row followed by a "podkormka" 1/ application of a general fertilizer (160 pounds per acre.) During the growing season the fields were cultivated five times between rows and the plants in the row were hoed seven times. About the time the bolls began to form, a third application ("Podkormka") of fertilizer (160 pounds per acre) was given. After the bolls were formed the plants were top-pruned to let light and heat into the interior and superfluous buds removed by hand. This farm is reputed to have produced 1,255 pounds of seed-cotton per acre in 1936. Rainfall was plentiful and well distributed throughout 1937 and an average yield of 1,960 pounds of seed-cotton per acre on 3,144 acres was expected.

Tillage methods vary widely from farm to farm. Though there is much room for improvement in most cases, the general technique applied to cotton growing in the Soviet Union has shown considerable progress during recent years.

1/"Podkormka" fertilization is accomplished by means of a several-row cultivator equipped with a tank for liquid manure. Tubes extend from a regulating compartment at the lower rear of the tank down the heel of each cultivator tooth. The liquid with fertilizing materials in solution and suspension is deposited about eight inches below the surface of the ground.

HARVESTING AND DELIVERY.

Cotton ripens in September and is almost entirely hand picked. Each picker is assigned a specified number of rows equivalent to a certain acreage that can be gone over in five or more days. Each picker is provided with a large sack, worn like an apron, with a large compartment next to the body and two or three smaller compartments in front. As the cotton is picked, it is put into one of these pockets according to seed-cotton grades established by the Textile Industry. Standard samples are made up; with which pickers familiarize themselves before picking begins. There are five seed-cotton grades which can be roughly characterized as: white with brilliant luster; white to yellow with dull appearance; yellow to reddish yellow; deeply colored locks; and bollies. The first grade is subdivided into "select", "normal" (middling) and "low". Each picker exercises his own judgment as to the grade of the locks picked from each boll.

The cotton picked by each individual is weighed separately by grade and payment is made according to the quantity picked. Preliminary weighing is done in the field and the cotton is hauled to the central weighing shed. If the cotton has a higher moisture content than specified by the textile industry as normal to a particular seed cotton grade, it is artificially dried. Otherwise, it is stuffed into sacks furnished by the procurement agent, weighed, hauled to the nearest procurement point and delivered to the agent of the Textile Industry.

Although the picking of cotton proceeds continuously from the opening of the first bolls to the gathering of the last unopened bolls after severe frost, the picking campaign in the "New Regions" is roughly divided into four periods:

The first period begins, on the average, about September 1 when some 10 per cent of the plants have at least one opened boll and continues 5 to 7 days. At this first picking a perceptible portion of the bolls have opened prematurely on account of disease. The average picker gathers about 44 pounds of cotton in a day for which he is allowed pay for 1½ days.

The second picking is a continuation of the first and proceeds until 5-7 days after the first frost. During this period, the entire available force of each collective farm is in the field. Only cotton from fully opened bolls is harvested at this time. The average picker gathers about 88 pounds of cotton in a day for which he is allowed pay for 1½ days.

The third picking is a continuation of the second, beginning about a week after the first frost. Cotton is picked from fully opened bolls but partially opened bolls are also gathered and the cotton separated later. The average picker gathers about 33 pounds per day for which he is allowed pay for 1½ days. Sometimes mechanical means are employed;- sledge type harvesters.

The forth picking clears the field of unopened bolls which are then opened by hand. The average worker gathers about 132 pounds of boles from which he extracts about 33 pounds of seed-cotton in a day and receives pay for 1½ days. This work should be completed by December 1. The field is then cleared of stalks and plowed, weather permitting.

According to the contract signed in 1936, each collective farm or individual producer of cotton was obligated to deliver at the warehouse at the procurement point all cotton of the harvest of 1936 but not less than a specified number of short tons of seed-cotton as fixed by the contract not including the seed-cotton payments in kind made to M.T.S. 1/

All cotton must be delivered with the least possible delay, at the expense of the producer, to the nearest procurement agent of the Textile Industry. No cotton is to be retained by producers or by M.T.S. for any reason whatsoever. Seed-cotton must be clean, graded and without higher moisture content than is normal for each grade. Final payment for seed-cotton is made in cash on the basis

---

1/"Zagotovki Khlopka", Moscow 1936. This has led, in many cases, to producers safeguarding themselves by planting an acreage in excess of that called for in the contract. As a rule, this excess acreage is not reported and yields appear higher than those actually obtained.

of the percentage of each of the seed-cotton grades making up the total quantity delivered. 1/ These prices, which vary widely in the three cotton-growing regions, include a basic price (Table 13) plus a premium for the quantity of delivered cotton per acre over and above the contract quantity.

The lowest prices for seed-cotton are paid in Central Asia where cotton-growing has been a long established industry. Nearly fifty per cent higher prices are paid to the growers in Transcaucasia (where there has been a downward trend in acreage during the five year period 1933-37,) than paid in Central Asia. (Table 12.) To stimulate cotton-growing south of the Caucasas mountains, higher prices are paid for bollie cotton of American type in Transcaucasia than for white grade I (normal) in Central Asia.

Table 12.- Seed-cotton: Basic prices paid in the Soviet Union in 1937 for one short ton of specified grade in specified producing regions 1/

Region	Seed - cotton grade						
	White			Tinted			Bollie
	I (select)	I (normal)	I (low)	II	III	IV	V
	Rubles	Rubles	Rubles	Rubles	Rubles	Rubles	Rubles
			COTTON OF AMERICAN ORIGIN				
Transcaucasia	1619	1542	1465	1311	1234	1157	1080
New Regions	1429	1361	1306	1225	1157	1089	1021
Central Asia	1098	1043	998	907	835	780	730
			COTTON OF LOWER EGYPTIAN ORIGIN				
Transcaucasia	3592	3420	3248	2903	2667	2395	2050
Central Asia	2427	2313	2195	1964	1805	1619	1388

1/Rubles per metric ton reduced to rubles per short ton by dividing by 1.1023. In 1937, the Textile Industry paid a premium of 50 per cent in addition to the above prices to collective farmers producing cotton of American origin in Transcaucasia and Central Asia who obtained yields of not more than 535 pounds of seed-cotton per acre; 100 per cent when yields were 536 to 892 pounds; 150 per cent when yields wer 893 to 1,338 pounds and 200 per cent when yields were more than 1,338 pounds per acre. In the case of Egyptian cotton the same percentage increases were paid when yields were less than 357 pounds; 358 to 624 pounds; 625 to 892 pounds; and 200 per cent when yields were more than 892 pounds per acre.

In the "New Regions", a premium of 150 per cent was paid when yields were higher than 223 pounds per acre. Premiums paid to independent farmers are half as much as those paid to collective farmers.

"Zagotovka Khlopka",1936,Moscow, p.13-15.

1/Before making final payment the procurement agent deducts the cost of seed, the amount of cash he has advanced to growers, the cost of cotton products he has delivered to farms, and interest at 3 per cent per annum on deferred payments.

Higher prices are,also, paid for cotton of American origin grown in the "New Regions" north of the Caucasas mountains than are paid in Central Asia. The percentage of bollies is high in these regions, where yields per acre are unusually low. To stimulate interest in cotton-growing and increase income per acre to collective farms, the Textile Industry pays farmers in the "New Regions" a higher price for bollie cotton than for white grade I (low) in Central Asia.

Not only is cotton production in the Soviet Union stimulated by adjustments of prices and premiums to further the plans of the Government in respect to the building up of the industry, particularly in Transcaucasia and the New Regions; but,also, aid is extended to growers by seed-credits, cash advances and the sale of cotton products at reduced prices.

SEED, CASH AND OTHER ADVANCES TO COTTON FARMERS

Before the beginning of the spring campaign, the Textile Industry, through its procurement agents in each district, delivers to each cotton-growing collective farm and independent farmer in his district a quantity of seed sufficient to plant the acreage specified in the contract. In 1937, delivery of seed to collective farms was reported to have begun about February 1, whether the contract had been formerly signed or not. Each lot of seed thus delivered was accompanied by a certificate guaranteeing the variety, the purity and the germination test. Seed may be paid for in cash at prices ranging from 28 to 64 rubles per short ton depending upon the degree of purity of type, or the seed may be received on credit to be paid after harvest together with interest at 3 per cent.

The agent at each permanent warehouse of the Textile Industry advances cash to the growers (collective farms and independent farmers) on the basis of the number of tons the grower contracts to deliver. There are three such advances: 1st) at the time the contract is signed; 2nd) after the acreage seeded has been verified; and 3rd) after the second cultivation.

The total amount of the cash advanced varies in different regions and with the different types of cotton planted. Thus for each metric ton 1/ of an American type of seed-cotton specified as the minimum quantity to be delivered by a collective farm the total sum advanced is 550 rubles in Transcaucasia, 400 rubles in the "New Regions" and 375 rubles in Central Asia. Advances to individual farmers whose household does all of the work on its land holding are about 2/3 of that made to collective farms. Advances to "Kulaks"; that is, individual farmers who employ labour; are only half as much as to collective farms. In Transcaucasia advances to growers of Egyptian cotton total 1,100 rubles per estimated ton to be delivered; whereas, in Central Asia the advances total only 750 rubles. Interest at the rate of 3 per cent per annum is charged on all cash advances.

According to the decree of March 7, 1935, not less than 85 per cent of the advances received by cotton growing collective farms is distributed among the collective farmers themselves for immediate payment of part of their daily wage. From the amounts advanced, it is evident that the Soviet Government is offering growers in the "New Regions" and in Transcaucasia greater inducements to increase cotton acreage than are being offered to the growers of Central Asia.

At the time of closing the contract and at specified times thereafter, cotton seed oil, oil cake and linters are delivered to the grower, who pays for these products at a rate below the usual market prices. 2/

1/One metric tons equals 1.1023 short tons.
2/Prices paid by collective farms at Anapa, Azov-Black Sea Krai in 1937 were: oil: 2.50 rubles per kg.; oil cake: 0.12 rubles and linter 0.80 rubles per kilogram.

QUALITY OF SEED-COTTON

The best grades of cotton are grown in Transcaucasia and in Turkmenistan. Cotton, with a comparatively large percentage of white grades, is,also, produced in the desert oases and valley districts of Uzbekistan and the western valley districts of Tadjikstan. Nearly 70 per cent of the cotton acreage of the Soviet Union is located in these five districts, (Group I, Table 13;) which are characterized in general (but with local exceptions) by a relatively long growing season and intense heat in mid-summer. Under these conditions, cotton ripens more fully than in other regions and, in 1935, had a comparatively high percentage of Grade I white cotton (70.36 to 86.30 per cent). There was a relatively low percentage of bollie cotton (0.79 to 12.62 per cent).

Table 13.- Seed-cotton grades: Percentage of the total production graded as I (white); II,III,IV; (colored); and V (bollie) in the Soviet Union compared with acreage planted in specified districts in 1935

District	Acreage	Grade of seed-cotton		
		I (white)	II,III,IV (tinted)	V (bollie)
GROUP I.	1000 acres	Per cent	Per cent	Per cent
Transcaucasia:				
Georgia	44.5	86.30	12.91	0.79
Armenia	13.8	79.27	14.52	6.21
Azerbaidjan	477.9	73.25	17.33	9.42
Central Asia:				
Turkmenistan	381.3	73.85	15.21	10.04
Uzbekistan	2,187.4	70.81	17.60	11.59
Tadjikstan	252.3	70.36	17.02	12.62
TOTAL GROUP I	3,357.2			
GROUP II.				
Central Asia:				
Kazakstan	279.2	66.74	20.94	12.32
Kirgizia	162.8	62.68	18.74	18.58
Kara Kalpak	113.2	48.14	34.09	17.77
New Regions:				
Ordjonikidzev krai a/	350.6	69.26	13.25	17.48
Crimea	74.1	64.31	22.36	13.32
Ukraine	387.2	41.25	33.85	24.90
Azov-Black Sea	90.2	36.30	40.19	23.52
Other	12.6	b/	b/	b/
TOTAL GROUP II	1,469.9			
TOTAL U.S.S.R.	4,827.1	69.31	18.41	12.28

a/Includes Dagastan and Tchetcheno Ingush. b/Grades of seed cotton not separately specified.

Percentage of seed-cotton grades: compiled from "Ekonimika Khlopkootchistitelnoe Promyshlenosti",Moscow, 1937, p.120. Acreage from: "Socialist Construction in the U.S.S.R.", Moscow, 1936, p.277.

The cotton grown in Kazakstan and Kirgizia, in 1935, as graded by the Textile Industry, comprised 63-67 per cent white grades, 19-20 per cent tinted and 12-19 per cent bollie cotton. The bulk of cotton produced in Kazakstan is grown west and north of the Oasis of Tashkent and that produced in Kirgizia is grown largely in districts fringing the valley of Fergana in eastern Uzbekistan , the most important cotton growing region of the Soviet Union. Climatic conditions are somewhat less favorable in these two republics than in Uzbekistan and the quality of the cotton produced is somewhat lower.

Karakalpak produces an unimportant quantity of cotton of low quality in the lower valley and delta of the Amu Darya river. This district is characterized by a relatively short growing season. In 1935, only 48 per cent of the production was classified as Grade I, white, 34 per oent was tinted and 18 per cent bollie.

Fairly good cotton is produced in the southermost district of the European part of the Soviet Union in Ordjonikidzev district 1/ just north of the Caucasas mountains. The climate of this district is modified by the hot east winds coming from the Asiatic deserts. Fairly good cotton is,also, produced in the Crimean Peninsula where the climate is modified by the Black Sea. The growing period is slightly longer than in other parts of European Russia and mid-summer temperatures are higher. Cotton matures more rapidly and there is less frost damage. The 1935 production in these two districts graded 64-69 per cent white, 13-22 per cent tinted and 13-17 per cent bollie.

The poorest cotton produced in the Soviet Union is grown in the Azov-Black Sea krai (East of the Black and Azov Seas) and in the Ukrainian Republic to the north of the Black Sea.

1/Includes Dagastan and Tchetcheno Ingush.

The growing season is short, mid-summer temperatures are not as high during the day as in the regions to the south and drop sharply at night. A large part of the crop is not fully matured when caught by the frost. There was, in 1935, a high percentage of tinted grades (34 to 40 per cent) in the cotton produced in these districts, and only 36 to 41 per cent of the cotton delivered to the procurement agents of the Textile Industry in that year could be classed as white. About one fourth of the crop was bollie cotton (24-25 per cent.)

Notwithstanding the low yields in the "New Regions", cotton-growing in the Soviet Union reached a relatively satisfactory position in 1936 from the point of view of quantity. Although the grade of seed-cotton produced on the northern fringes of the European and Asiatic cotton-growing regions has been consistantly low, the general average percentage of white grades in the production of the Soviet Union, as a whole, has tended to increase during recent years, 1/ largely because cotton acreages have been planted with strains better adapted to local conditions of soil and climate than formerly.

Cotton: Percentage of seed-cotton grades in the total production. 1933-36.

Year	White Cotton Per cent	Tinted Cotton Per cent	Bollie Cotton Per cent
1933	68.3	22.6	9.6
1934	43.9	28.9	27.2
1935	69.3	18.4	12.2
1936	71.8	18.2	7.1

Same source as in Table 14.

It is reported that the Textile Industry considers the quality of the cotton produced in Soviet Union to be satisfactory as regards seed-cotton grade and is,now, demanding that cotton-breeders bend their energies chiefly to

---

1/Excepting the poor crop-year 1934.

increasing the length of staple without loosing other breed characteristics. 1/

VARIETY AND QUALITY

To both the textile industry and the cotton-breeders in the Soviet Union a particular variety-name or number has recently come to be more or less synonymous with fiber-length, qualified by other desirable characteristics,- length of growing period, proportion of lint, weight of bolls, disease resistance, etc. Viewed from this angle, the present cotton-breeding problem in the Soviet Union is largely one of producing the longest fibred strains of cotton that will mature under the temperature and soil conditions of each of the several zones into which the cotton growing raions (counties) have been segregated.

EGYPTIAN COTTON

Late maturing Egyptian cotton would meet the desires of the Soviet Textile Industry for length of staple in cotton but there are only a few districts of Central Asia and Transcaucasia that have a suitable climate for maturing these late cottons. Within these districts, there is either a limited amount of water available for irrigation or a limited amount of land suitably situated to permit irrigation to be employed.

1/In its endeavor to obtain high yields and better ginning percentages, the Textile Industry neglected to concentrate attention on length of staple. As a result, the production of cotton of a fiber length of 1-3/32 to 1-5/32 inches or longer decreased from 40 per cent of the total crop to 25.8 per cent in 1931. (Lubimov, I., "Pravda" Moscow, May 10,1934, quoted in State Department No.436,August 25, 1934.) In recent years an improvement has been noted in length of staple as well as in yield. On December 7,1936, 57.6 per cent of the cotton ginned to that date exhibited a staple length of 1-5/32 to 1-3/16 inches or longer. The total crop possessed the following characteristics as regards length of fiber:

Length of fiber Inches	Percentage Per cent	Length of fiber Inches	Percentage Per cent
15/16 to 31/32 and shorter	0.3	1-3/32 to 1-3/16	17.0
31/32 to 1-1/16	7.5	1-5/32 to 1-7/32	18.1
1-1/16 to 1-3/32	17.6	1-7/32 to 1¼ and longer	39.5

"Ekonomika Khlopkootchistitelnoi Promyshlenosti",Moscow,1937, p.124.

In 1937, about 55 per cent of the total cotton acreage of the Soviet Union was reported to have been planted to cotton varieties of American origin that in laboratory tests showed a staple length of 1-5/32 to 1-3/16 inches and longer and an additional 6 per cent to long staple varieties of Egyptian origin.(Raionirovanie Sortov Khloptchatnika na 1937.)

The first experiments in the acclimatization of Egyptian cotton in the Soviet Union were undertaken in 1926. 1/ In 1928, only 84 acres producing 100 bales, were planted in Turkmenistan. The following year cultivation of Egyptian cotton was extended to Tadjikstan and in 1930 to Uzbekistan. Finally, in 1931, this type of cotton was planted in Azerbaidjan, where more favorable conditions were found and which is now the chief district in the Soviet Union for growing "lower" Egyptian cotton.

The expansion of the acreage of Egyptian varieties was relatively rapid, when one takes into consideration the fact that all peasant farmers were inexperienced in growing this type of cotton and in some cases (particularly in Tadjikstan) in growing any kind of cotton.

Table 15.- Egyptian Cotton: Acreage and production in the Soviet Union 1931 to 1936, and plan 1937

Year	Acreage	Production	Yield per acre
	Acres	a/ Bales	a/ Pounds
1931	52,494	--	--
1932	124,113	--	--
1933	188,646	48,427	123
1934	267,624	70,566	126
1935	285,312	95,932	161
1936	306,898	138,364	216
1937	b/ 309,073	--	--

a/Calculated from rounded figures that were probably approximations. b/Plan as given in "Kontraktatziya i Zagotovka Khlopka, Moscow, 1937, p.32. Acreage 1931 to 1936 from "Sotzialistitcheskaya Rekonstruktziya Selskogo Khozyaistva", No.2, February 1937, p.113. Production 1933 to 1936 from "Legkaya Promyshlenost" Vol.1,1937, p.13.

During the early years of the second five-year plan period (1933-37) several varieties of "upper" and "lower" Egyptian cotton were distributed to growers without previous acclimatization, But it required only a brief period of practical experience to demonstrate that many of the introduced varieties were not suited to any locality in the Soviet Union. These varieties were discarded.

1/In Turkmenistan by a cotton-specialist named Avtonomov. "Socialist Reconstructio of Agriculture", No.11,1935.

Table 16.- Cotton: Characteristics of and acreage of varieties specified in contracts made between Textil Industry and growers in the Soviet Union in 1937.

Variety name or number	Laboratory length of staple	Acreage	Length of growing period: Range	Length of growing period: Average	Commercial length of staple	Proportion of lint	Weight of bolls
	Millimeters	1000 acres	Days	Days	Inches	Per cent	Ounces
	VARIETIES OF EGYPTIAN ORIGIN						
MAARAD	40 ... 42	97		157-161	1 17/32 - 1 27/32	28.0 - 35.5	
PIMA	38 ... 42	66	130-180	157	1 1/2 - 1 23/32	27.0 - 30.0	.11-.12
a/ FOUADI	37 ... 38	104			1 11/32 - 1 1/2	28.0 - 35.0	
PIMA 23	NEW UNDESCRIBED VARIETIES	16					
1409		14					
182		8					
486		2					
243		2					
		309					
	VARIETIES OF AMERICAN ORIGIN						
2034	33 ... 34	353	118-140	129	1 7/32 - 1 11/32	29.0 - 30.5	.19-.21
36M2	31 ... 33	872	125-145	134	1 3/16 - 1 5/16	33.5 - 34.5	.21
491	30 ... 32	2	120-140	130	1 5/32 - 1 5/16	32.9 - 35.6	.18-.23
8517	30 ... 31	1,168	120-142	131 1/2	1 5/32 - 1 1/4	35.0 - 38.0	.21-.23
	Total long staple	2,395					
2017	29 ... 31	74	115-133	125	1 3/32 - 1 5/16	31.0 - 32.7	.16
246	28 ... 30	173	117-132	127	1 1/16 - 1 1/4	31.0 - 35.0	.14-.18
114	28 ... 30	149	115-133	125	1 1/16 - 1 3/32	32.5 - 35.3	.15-.17
	Total medium staple	396					
169	27 ... 28	95	114-132	124	1 1/32 - 1 3/16	28.5 - 30.0	.14-.16
915	27 ... 28	52	112-128	121	1 1/32 - 1 5/32	34.3 - 37.2	.15-.18
NAVROTZKIE	26 ... 28	139	120-140	130	31/32 - 1 5/32	33.0 - 35.0	.18-.21
1306	26 ... 28	1,715	109-127	119	31/32 - 1 5/32	30.0 32.5	.12
	Total short staple	2,001					
8582	NEW UNDESCRIBED VARIETIES	25					
13761		25					
20042		9					
	Total new strains	59					
	Total AMERICAN	4,851					
	TOTAL U.S.S.R	5,160					

a/ Data on characteristics of "Fouadi" from "Khlopok Syretz", Moscow, 1936.
Characteristics other varieties from "Standarty na sorta Khloptchatnika", Moscow, 1935.
Acreage from "Kontraktatziya u Zagotovka Khlopka", Moscow, 1937.

SPECIAL REPORT No 336
COTTON
SOVIET UNION

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
FOREIGN AGRICULTURAL SERVICE
DANUBE BASIN OFFICE

It was found that most localities were in no way suited to growing Egyptian cottons. Therefore, attempts were abandoned to grow these cottons in districts not specially suited to the few varieties of "lower" Egyptian origin that are now planted commercially.

During the introductory period hopes were entertained of a possible million and a half acres under Egyptian cotton in Central Asia,alone, by 1937, 1/ but these hopes were later scaled down to 568,000 acres as the probable goal for the Soviet Union as a whole in that year. 2/ Even this latter hope was not realized. The Procurement Division of the Textile Industry reports that, in 1937, contracts were made for only 309,073 acres distributed in four regions, to be planted with Egyptian cotton. Three standard varieties: "Fouadi", "Maarad" and "Pima" account for the bulk of the acreage. In addition, several recently developed varieties occupied small acreages.

Most of the Egyptian cotton, grown in the Soviet Union, in 1937, was planted in the hot bottom land below the level of the Ocean, in the lower Kura river in Azerbaidjan, Transcaucasia. Contracts were reported for 123,550 acres to be planted chiefly with "Fouadi" characterized by a staple length of 1-11/32 to 1½ inches. 3/

Contracts were reported for 74,130 acres of Egyptian cotton to be planted in the extreme south of Uzbekistan in the lower valley of the Syrkhan Darya river. Most of this acreage was planted with the standard variety "Maarad" that under field conditions has produced a staple length of 1-17/32 to 1-27/32 inches. 4/

1/"Revolution and Nationalities", Moscow, Vol.1,1934. Quoted by State Department despatch No.436, August 25,1934. 2/ "Second Five-year Plan", Moscow, Vol.1.
3/"Khlopok-Syretz", Moscow, 1936, opposite page 74. Calculated to the nearest 1/32 of an inch from reported millimeters by the factor 1 inch = 25,4001 mm.
4/"Standarty na sorta Khloptchatnika" Moscow 1935.

Egyptian cotton is grown in the lowest southern river valleys of Tadjikstan. It is reported that, in 1937, contracts were made for 66,915 acres to be planted chiefly with "Pima" with a staple length described to be about 1½ to 1-23/32 inches.

The fourth region suitable for growing Egyptian cotton is in the desert oases of Turkmenistan where acreage under contract for the crop of 1937 was reported to be 44,478 acres planted almost exclusively to "Maarad" and "Pima".

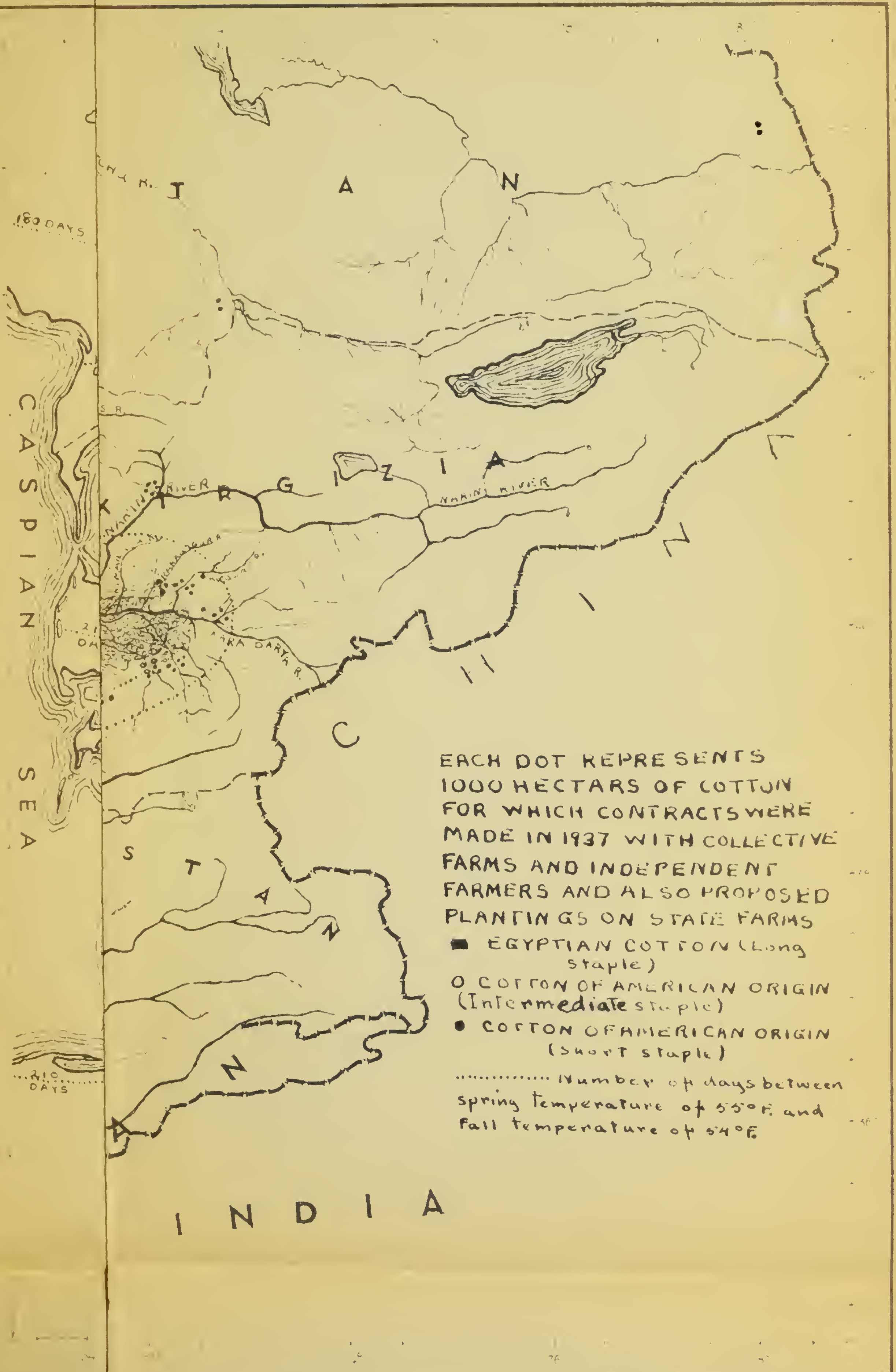
Although it is possible to grow varieties of Egyptian cotton in the Soviet Union with a staple length greater than that of the longest stapled American cotton, the weight of the bolls is less than of those produced by the best American types suited to Russian conditions. This results in relatively poorer yields than are obtained from the medium to long stapled cottons of American origin. The proportion of lint is, as a rule, less than that of the short stapled varieties of American origin now grown.

Cotton breeders in Central Asia and Transcaucasia are striving to produce new strains of Egyptian cotton and experimenting with those already isolated to maintain staple-length to increase yield and the ginning coefficient (which is low) as well as to shorten the length of the period required for maturity. Five such newly developed strains of Egyptian cotton were being given field tests in 1937.

In 1937, the acreage reported to be under contract to be planted to Egyptian cotton was only 6 per cent of the total acreage reported for the Soviet Union as a whole. Any future increase in this percentage relation of the acreage of Egyptian to total acreage of cotton will probably be a matter of slow development unless means are found to increase the supply of water sufficiently to irrigate new acreages in the four regions that have been found climatically best suited to the development of long staple cottons. As pointed out in the preceeding pages such an increase of water supply cannot be made except at a very considerable expenditure of labor and capital.

Special
Cotton
Soviet U

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
FOREIGN AGRICULTURAL SERVICE
DANUBE BASIN DISTRICT



EACH DOT REPRESENTS 1000 HECTARS OF COTTON FOR WHICH CONTRACTS WERE MADE IN 1937 WITH COLLECTIVE FARMS AND INDEPENDENT FARMERS AND ALSO PROPOSED PLANTINGS ON STATE FARMS

- ■ EGYPTIAN COTTON (Long staple)
- ○ COTTON OF AMERICAN ORIGIN (Intermediate staple)
- ● COTTON OF AMERICAN ORIGIN (short staple)

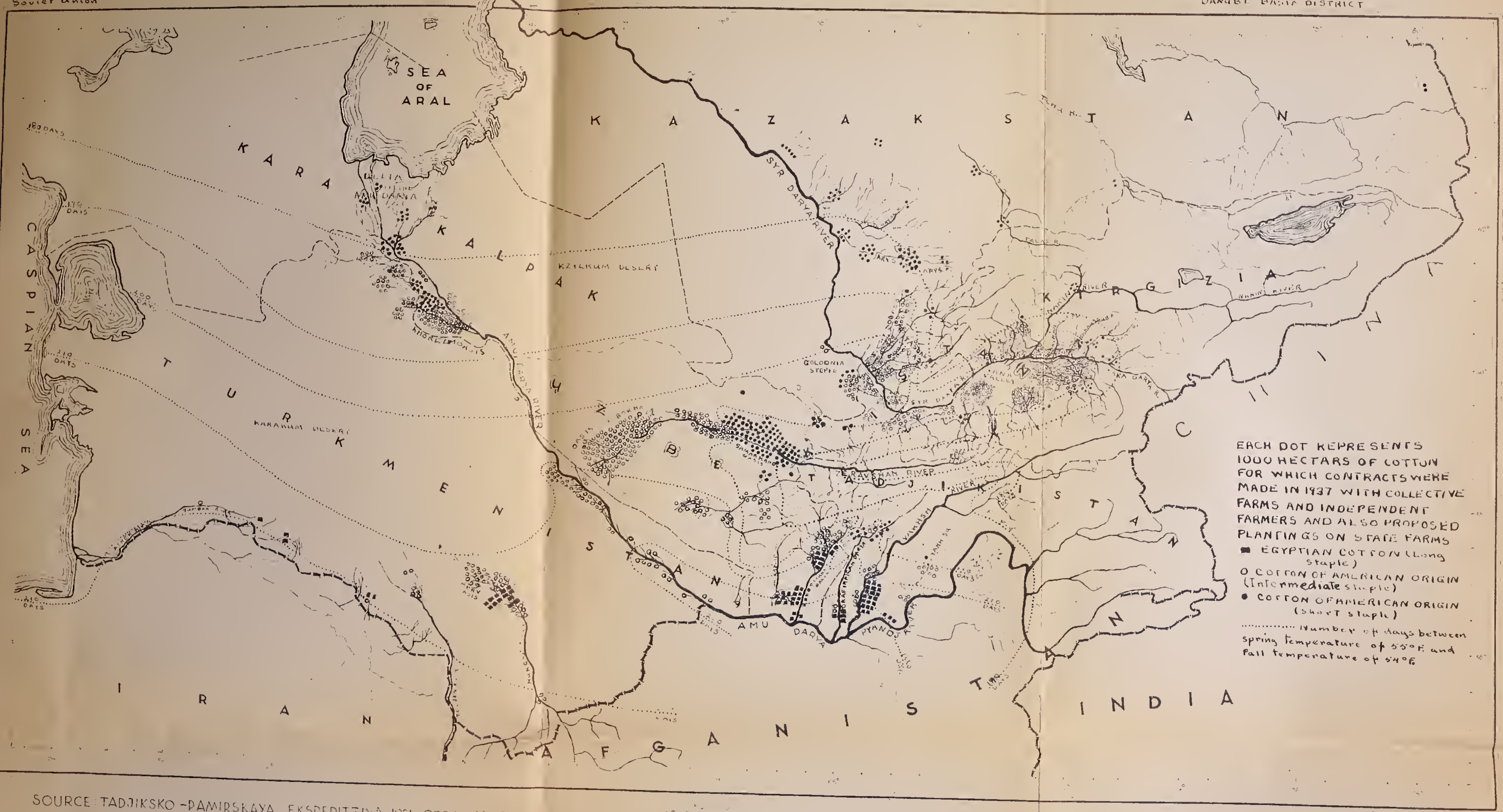
…………… Number of days between spring temperature of 55°F. and fall temperature of 54°F.

SOU

Special Report № 336
Cotton
Soviet Union

COTTON-GROWING RAIONS OF CENTRAL ASIA 1937

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
FOREIGN AGRICULTURAL SERVICE
DANUBE BASIN DISTRICT



EACH DOT REPRESENTS 1000 HECTARS OF COTTON FOR WHICH CONTRACTS WERE MADE IN 1937 WITH COLLECTIVE FARMS AND INDEPENDENT FARMERS AND ALSO PROPOSED PLANTINGS ON STATE FARMS

- ■ EGYPTIAN COTTON (Long staple)
- O COTTON OF AMERICAN ORIGIN (Intermediate staple)
- ● COTTON OF AMERICAN ORIGIN (Short staple)
- ……………… Number of days between spring temperature of 55°F. and Fall temperature of 54°F.

SOURCE: TADJIKSKO-PAMIRSKAYA EKSPEDITZIA 1935 GODA, MOSCOW 1937

MEDIUM TO LONG STAPLE COTTON OF AMERICAN ORIGIN.

The bulk of the cotton produced in the Soviet Union is medium to long stapled cotton of American origin. This cotton is grown on irrigated land along river courses and in desert oases between the regions that grow Egyptian cotton in the south and those that grow short staple cotton in the higher foot-hill valleys or in less favored localities on the northern fringe of the cotton belt. In 1937, the Textile Industry made contracts with growers to plant seven described varieties of medium staple cotton on about 2,791,000 acres or on about 54.5 per cent of the total acreage of that year.

In those regions in Central Asia where Egyptian cotton was grown in 1937 certain areas had, by experience, been found to give better results when planted with a variety of American origin called 36 M-2 that under field conditions produced a staple length ranging from 1-3/16 to 1-5/16 inches. This is a late maturing strain, with a growing period of 125 to 145 days, developed from the American type "Acala". Variety 32 M-2 was specified in 1937 contracts for 872,000 acres along the middle course of the Amu Darya, along the lower reaches of the Zeravshan. and on the fringes of the Egyptian cotton districts in Tadjikstan, southern Uzbekistan and in the desert oases of Turkmenistan.

The leading variety of cotton grown in the Soviet Union is a medium late variety called No.8517, which was developed at the Central Breeding Station of Central Asia in 1929-30 from the American type "Akala". It has a described staple length of 1-3/32 to 1¼ inches, and matures in from 120-142 days. This strain was specified in 1937 contracts for planting 960,000 acres in Fergana, the most important cotton-growing region in Russia in the upper valley of the Syr Darya, and on farms just across the Fergana frontier in Kirgizia. No.8517 was,also, specified in contracts covering 208,000 acres scattered in other regions in Central Asia.

The third most important cotton, as regards acreage planted, is a medium early variety, called No.2034, developed in Central Asia from the American Type "Express Webber". This variety has a described length of staple of 1-7/32 to 1-11/32 inches and matures in 118-140 days. It was specified in 1937 contracts for planting 353,000 acres in Northern Uzbekistan around Tashkent and across the frontier in Southern Kazakstan.

These three strains of cotton tracing their pedegree back to "Akala" and "Express Webber" were specified in 1937 contracts for planting about 2,393,000 acres in Central Asia. About 398,000 additional acres less favorably located in Central Asia and Transcaucasia were, according to reports of the Textile Industry, under contract in 1937 to plant four other standard strains with staple lengths ranging from 1-1/16 to 1-5/16 inches.

SHORT STAPLE COTTON OF AMERICAN ORIGIN

In the struggle for acreage, cotton growing has been extended into the "New Regions" of the European Part of the Soviet Union and into southern Kazakstan and Kara Kalpak ,1/ to the north of the regions where cotton was grown before the World War. In many of these localities; into which cotton-growing has been introduced, particularly on the northern outskirts, the climatic conditions are marginal for the production of first class cotton if the quality of the 1935 crop may be considered indicative. Cotton-growing has,also, been thrust into the marginal conditions of the upper valleys in the hill districts adjacent to the old cotton regions of Transcaucasia and of Uzbekistan, as well as into the hill valleys of Tadjikstan and Kirgizia.

The northerly latitude or the high altitude of these marginal districts so limits the growing season that only the short stapled or quick maturing strains can be grown.

1/In Central Asia cotton production has been extended northward to 44° north latitude "although it was already considered risky in the neighborhood of Tashkent (41.2 degrees north)", Prianishnikov, Specialized Agriculture 7th edition,1929, p.612. Quoted by L.Volin, See footnote 4, page 1.

Practically all of the "New Regions" are planted with a short staple strain of cotton called No.1306 that was developed in Central Asia in 1920-21 from a variety called "Shreder" that, in turn, was developed from the original American type "King". This strain matures in 109-127 days and is characterized by a staple length of 31/32 to 1-5/32 inches . No.1306 was,also, specified, in 1937, for planting cotton acreage in the high valleys of Transcaucasia, Tadjikstan and Kirgizia; in the upper portion of the Oasis of Samarkand, in the Delta of the Amu Darya and throughout most of Kazakstan. In all, some 1,715,000 acres were to be planted with this strain.

A similar strain of cotton called No.915,also, descended from "King" was planted in some of the upper valleys of Transcaucasia. Another strain called 169, developed in the Golodnia Steppe, accounted for a few thousand acres in Uzbekistan and Tadjikstan. "Navrotzkie", a descendent of the American type "Russel", once a popular variety in Russia, was specified in 1937 contracts covering 139,000 acres in the central raions of Samarkand Oasis. These latter strains have been giving place to medium staple-length cotton in recent years. Whereas; more than 1,000,000 acres of these three varieties were specified in 1936 contracts, less than 300,000 acres were specified in 1937. The tendency of the last few years has been to reduce the number of strains planted in the Soviet Union, to plant strains better adapted to local conditions and to push medium staple cotton farther north and higher into the foot-hill valleys.

Soviet cotton breeders are constantly striving to isolate strains that will mature in less than 109-127 days or else strains that, maturing within those ranges, will produce higher quality cotton as concerns length of staple and percentage of white grades of seed-cotton. A new strain of cotton (No.13751); which it is hoped will prove superior to the "Shreder" type; was being given extensive field tests in 1937 in Dagastan, just north of the Caucasas mountains, in Stalingrad in the lower Volga valley, and in the Ukraine.

IMPROVING THE QUALITY OF THE SEED MATERIAL.

The Soviet Government is stimulating cotton and other plant breeders by paying each year a substantial cash premium for each acre planted with the particular variety that any breeder has developed. Every cotton breeder is keenly alive to producing strains that will supercede those now grown. Breeders are obligated each year to exchange their material with other stations so that each has the opportunity to test his own results against those of his competitors.

Every station maintains its elite material of commercial strains in isolation plots. This material is passed on each year for the first-year increase to selected State farms or collective farms that specialize in seed production. These farms pass the first-year increase on to other selected farms for the second-year increase and these in turn to still larger circles of farms. Pedigree cotton is ginned separately under the supervision of agents of the Textile Industry. The general endeavor is to plant as large a percentage of the acreage each year with cotton of known parentage, to push longer-stapled and quicker maturing strains northward in latitude, and higher in altitude. This is at present one of the chief endeavors of the Government scientific stations and several of the State farms. A number of the large collective farms have employed a cotton breeder on their own account and are working under the advice of the central stations to develop seed material suited to local conditions.

FUTURE DEVELOPMENTS.

The problems facing the cotton-breeders of the Soviet Union have their limitations and present many difficulties. It is to be expected, however, that better strains of cotton will be isolated than those now planted and that the quality of cotton will continue to improve both as to staple-length and seed-cotton grade.

Yields per acre will,also, improve . The technique now employed in cotton production, though in many respects superior to the primitive practices of pre-war days, leaves much to be desired. Collective farmers are becoming more and more skilled in large scale farming and progress is to be noted from year to year.

The acreage now under cotton can be increased in the "New Regions". It has been stated (page 21) that 900,000 to 1,300,000 acres of land suitable to cotton planting is still available in European Russia. Yields in these "New Regions" are,however, low and the quality of the product is relatively poor. It is possible that, during the course of the next four or five years, acreage in the "New Regions" will be expanded materially above the 1,278,000 acres for which contracts were let in 1937.

It is improbable that the cotton acreage will be materially increased, without the construction of costly irrigation works, in Central Asia or Transcaucasia where the best quality cotton is produced. There is much good land suitable for growing cotton but the supply of water for irrigation is limited by the capacities of the irrigation systems now operating. These capacities are already taxed to meet present requirements.

It is reported that, in the Khoresm region 1/in the lower Amu Darya valley, there are 4,621,000 acres "completely fit for irrigation"; 791,000 acres requiring slight reclamation and 1,631,000 acres requiring heavy reclamation 2/; whereas, in 1935, the seeded area in this region totaled 890,000 acres. There is a large desert area in the Golodnia Steppe suitable for irrigation. There are 1,236,000 acres of swamp lands in the Fergana valley that are suitable for drainage. It is reported that a retention dam in the upper Kura valley would make 2,471,000 acres available for cultivation in Azerbaidjan. There are several other similar

---

1/Includes the Khorezm Oasis of Uzbekistan, the delta of the Amu Darya in Kara Kalpak and Tashauz Okrug in northeastern Turkmenistan. 2/ Davis, A.P. "Civil Engineering", Vol.2, No.1, 1932, p.3.

projects for which plans have been drawn but on which no actual construction work has been begun. It is probable that work on irrigation projects in Central Asia and Transcaucasia will first be directed toward improving defective systems already operating, many of which are badly in need of reconstruction, rather than undertaking major construction with the purpose of bringing significant new acreages under irrigation. Several plans were projected for development in 1937 in six districts in Uzbekistan affecting 450,000 acres. Part of this development was designed to increase the water supply on land already under cultivation. 1/

The plans of the Soviet Government do not include an immediate expansion of the acreage under cotton as indicated by the plan for spring seeding in 1938 on collective farms, only, of 4,893,000 acres 2/ as compared with the similar plan for 4,887,000 acres in 1937 3/, and with 4,977,000 hectares reported to have been planted in 1936.

The production of 1936 was considerably in excess of the planned cotton consumption of the Soviet Textile Industry for 1937 in which year the industry planned to produce 4,190,000,000 yards of cloth. The actual output in 1937 was apparently 3,284,000,000 yards. Consequently (according to the Chairman of the Council of People's Commissars) stocks of cotton in the Soviet Union at the end of the year were stated to be "considerable and such as we have never had before" whereas in previous years, there have been hardly any carry-over stocks and frequently difficulties have been encountered in making supplies last until the end of the campaign. 4/

1/"Sowjetwirtschaft und Aussenhandel" Berlin Vo.16, No.11-12,1937, pp.51-53.
2/"Pravda", Jan. 28,1938. This figure does not include State farms.
3/"Izvestiya", Feb. 3,1937. This figure does not include State farms.
4/Report of Loyd V.Steere, Agricultural Attache, Berlin, dated March 7,1938.

The new Commissar of Light Industry recently stated that the Soviet Textile Industry is to produce 3,900,000,000 yards of finished fabrics and 617,000 short tons of yarn in 1938. This indicates a proposed increase of 19 per cent in manufactured cotton goods over the 1937 accomplishment . 1/

There is room for expansion of the manufacture of cotton-goods in the Soviet Union because the per capita consumption is undoubtedly low although it is difficult to estimate just how low. In 1935, it was stated that the per capita consumption of cotton in Soviet Russia was around 5.25 pounds, as compared with 21 pounds in the United States. In that year mill requirement was stated to have been around 2,000,000 bales as compared with 1,750,000 before the World War. The 1936 requirement was stated to be 2,750,000 bales and the 1937 projected requirement was 3,370,000 bales. This indicates an upward trend in the manufacture of cotton products which has undoubtedly been accompanied by increased domestic consumption. But even, today,there is no large per capita consumption of cotton in the Soviet Union except in Central Asia. In other parts of the country, the peoples have been accustomed to wearing clothing made out of wool and flax that was produced, spun, and woven at home. The manufacture of cloth as a household industry has practically ceased. The degree of the substitution of cotton goods for linen and woolens lies in the hands of the Government that controls the quantities and kinds of goods that are placed on sale in retail stores.

Much is spoken and written about raising the standard of living of the masses of the people in the Soviet Union and the degree to which this is accomplished will influence the consumption of cotton goods. The normal increase in population will,also, have its influence; but it is questionable whether, for some years to come the demand for cotton by the textile industry of the Soviet Union will exceed the capacities of the farms to produce. This question is associated with the extent to which Government policy will foster domestic production.

1/Ibid.

It is possible during the next few years to gradually increase the acreage under cotton, it is probable that better cultural methods will be applied and more suitable strains of cotton will be developed. It is not improbable for some years to come that, in normal years, production will keep pace with consumption.

On the other hand it is improbable, except in an unusual year, that production in the Soviet Union will result in any marked exportation of cotton to the markets of western Europe; but, in this phase of the situation Government policy will be the dominating factor.